

BeneVision

Central Monitoring System

Service Manual

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NOTE

-
- **This manual describes all features and options. The equipment may not have all of them. Contact Mindray service department for any questions.**
-

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FOR YOUR NOTES

1 Safety

1.1 Safety Information

⚠ DANGER

- Indicates an imminent hazard situation that, if not avoided, will result in death or serious injury.
-

⚠ WARNING

- Indicates a potential hazard situation or unsafe practice that, if not avoided, could result in death or serious injury.
-

⚠ CAUTION

- Indicates a potential hazard or unsafe practice that, if not avoided, could result in minor personal injury or product/property damage.
-

NOTE

- Provides application tips or other useful information to ensure that you get the most from your product.
-

1.1.1 Dangers

There are no dangers that refer to the product in general. Specific “Danger” statements may be given in the respective sections of this operation manual

1.1.2 Warnings

⚠️WARNING

- The device is intended for use only by clinical professionals or under their guidance. It must only be used by persons who have received adequate training in its use. Anyone unauthorized or untrained must not perform any operation on it.
 - The CMS is a clinical information device. Except for using such components as the mouse and keyboard to perform normal operations, do not touch or disassemble any other component, especially the power component; otherwise, it may result in personnel injury.
 - Do not connect this system to outlets with the same circuit breakers and fuses that control current to devices such as life-support systems. If this system malfunctions and generates an overcurrent, or when there is an instantaneous current at power ON, the circuit breakers and fuses of the building's supply circuit may be tripped.
 - Failure on the part of the responsible hospital or institution employing the use of the CMS to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazard.
 - Be sure to keep the packaging materials from children's reach. Disposal of the packaging materials shall comply with your local requirements.
 - If any value displayed on the screen of the CMS is abnormal or questionable, first determine the patient's vital signs by alternative means and then verify that the CMS or monitor is working correctly.
 - The physiological waveforms, parameters and alarms displayed on the CMS are transmitted from the monitor through the network. If there is a network failure, the data loss or delay may occur. Pay close attention to the patients during a network failure.
-

1.1.3 Cautions

CAUTION

- Hospitals without stable power source should use an Uninterruptible Power Supply (UPS) to power the CMS. When there is a power failure, the system should be shut down by following the specified shutdown procedure before the UPS is turned off. If the system has a sudden power failure, system failure may occur and consequently the system will not work correctly next time or even have a serious result.
 - The host of the CMS should be installed with the original Microsoft Windows's system and standard upgrade program, such as the service package. Illegal software may lead to abnormal or incorrect system operating.
 - The host of the CMS should be maintained every three to six months. Its long time continuous operating may lead to failure of the operating system.
 - Protect the device from damage caused by drop, impact, strong vibration or other mechanical force during servicing.
-

1.1.4 Notes

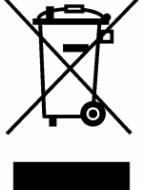
NOTE

-
- Refer to the Operator's manual for more information.
-

1.2 Equipment Symbols

	Refer to instruction manual/booklet.
	CAUTION: To reduce the risk of electric shock, do NOT remove cover. Refer servicing to qualified service personnel.
	Alternating current
	Power switch

	Keyboard port
	Mouse port
	Serial communication (COM) port
	Display port
	Printer port
	USB port or device
	Network port
	Sound output port
	Sound input port
	Microphone port
	DATE OF MANUFACTURE
	MANUFACTURER
	Serial number

	Equipotentiality
	<p>The following definition of the WEEE label applies to EU member states only.</p> <p>This symbol indicates that this product should not be treated as household waste. By ensuring that this product is disposed of correctly, you will help prevent bringing potential negative consequences to the environment and human health. For more detailed information with regard to returning and recycling this product, please consult the distributor from whom you purchased it.</p> <p>* For system products, this label may be attached to the main unit only.</p>

FOR YOUR NOTES

2 Introduction

2.1 Overview

BeneVision Central Monitoring System (hereinafter called CMS), including CentralStation, WorkStation and ViewStation, is intended for professional physicians or paramedics to conduct centralized monitoring over patients monitored by Mindray individual monitors and/or telemetry systems in hospitals or medical institutions.

The central monitoring system comprises powerful system software and high-performance computer. It constructs a monitoring network by connecting monitors and/or telemetry. By collecting, processing, analysing and outputting the information coming from monitors and/or telemetry, the central monitoring system can achieve centralized monitoring over multiple patients so as to greatly promote the efficiency and quality of the monitoring work.

2.2 Intellectual Property Protection

The BeneVision Central Monitoring System uses a USB dongle for intellectual property protection. You must plug the dongle into the system's USB interface before starting the system. Otherwise, the system cannot start.

NOTE

-
- When installing or using the CMS, you must plug in the USB dongle.**
-

If the dongle is damaged or lost, you may need to reinstall the system software before using a new one.

NOTE

-
- When reinstalling the system software, try not to remove the old database so as to keep the old monitoring data.**
-

2.3 Versions

The CMS system software, dongle and service manual versions correspond to each other as below.

CMS System Software	Dongle	Service Manual
02.01.XX	04.00.XX	1.0
02.01.XX	04.00.XX	2.0

3 System Installation

3.1 Pre-installation Preparations

3.1.1 Environmental Requirements

The CMS should be installed in an environment where the system can be easily viewed, operated and maintained.

The environment where the CMS is installed should be reasonably free from noises, vibration, dust, and corrosive, flammable and explosive substances.

If the CMS is installed in a cabinet, sufficient space in front and behind should be left for convenient operation, maintenance and repair. Moreover, to maintain good ventilation, the CMS should be at least 2 inches (5cm) away from around the cabinet.

When the CMS is moved from one place to another, condensation may occur as a result of temperature or humidity difference. In this case, never start the system before the condensation disappears.

3.1.2 Power Requirements

Each component of the CMS must be powered by the specified power source.

To protect the hospital personnel from electric shock, the CMS (including the host and displays) and its recorder must have their casings properly grounded. The host of the CMS is provided with a 3-wire power cable, which must be plugged into a properly grounded 3-wire receptacle. If a 3-wire, grounded receptacle is not available, consult the hospital electrician.

⚠️WARNING

- **Make sure that the operating environment and power source of the CMS meet the specific requirements; otherwise, unexpected consequences, e.g. damage to the equipment, may result.**
 - **Appropriate power supply must be selected according to the setup of the system power voltage; otherwise, serious damage may be caused to the system.**
 - **Never use a 3-wire to 2-wire adapter with any unit of the CMS.**
-

⚠️WARNING

- The CMS host cannot be installed with any other software besides the Windows system, necessary drivers, and drivers/software listed in this manual. Otherwise, normal operation of CMS may be affected and unexpected consequences may result.
-

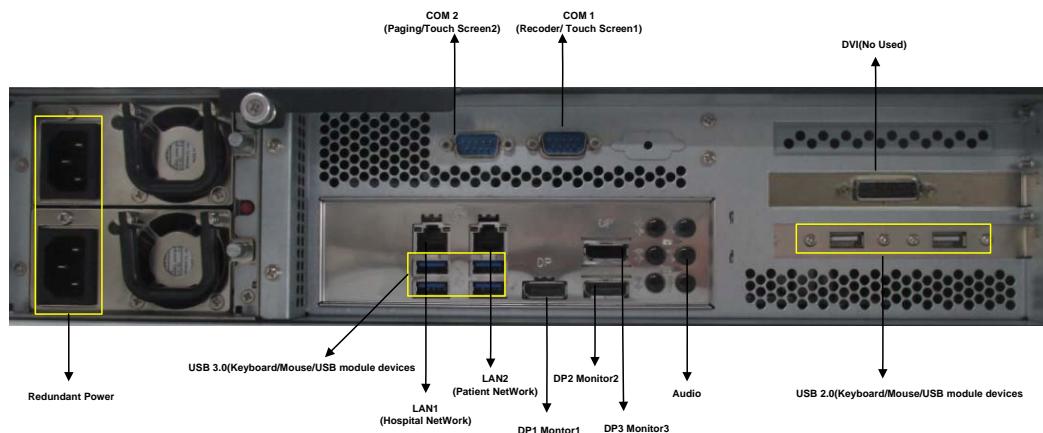
NOTE

- The CMS software only supports Windows® 7 Professional Embedded SP1 (32bit) operation system.
 - Before performing the operations described below, make sure that the main unit is not installed with any application software except the accompanying software of Windows.
-

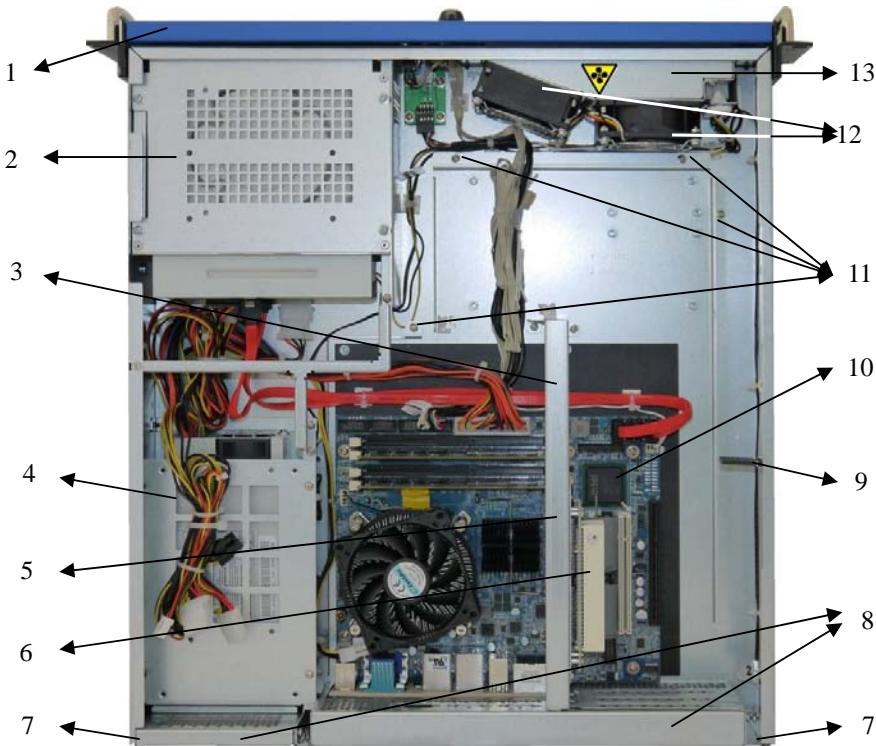
3.2 CMS Host

3.2.1 Kontron KISS 2U (023-001020-00)

Connectors



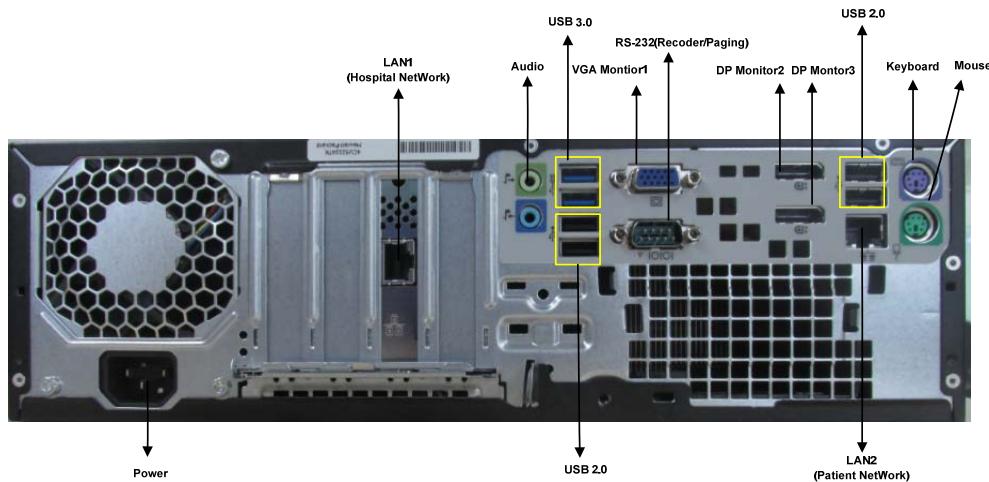
Assembly Diagram



1. Cover retaining plate on the front side
2. Drives bays (stacked one above the other into a drive cage)
3. Retaining bracket for the butterfly-backplane (not provided at system configuration with low profile cards)
4. Power Supply Unit (PSU)
5. Retaining bracket for the riser card (not provided at system configuration with low profile cards)
6. Riser card for expansion cards
7. Centring latches for the cover at the rear side
8. Cover retaining plate on the rear side
9. Card hold down bracket
10. Motherboard
11. Cage for motherboard and expansion cards
12. Fans (of the fan slide-in-module)
13. Fan slide-in-module with two fans

3.2.2 HP 800G1 (023-000969-00)

Connectors



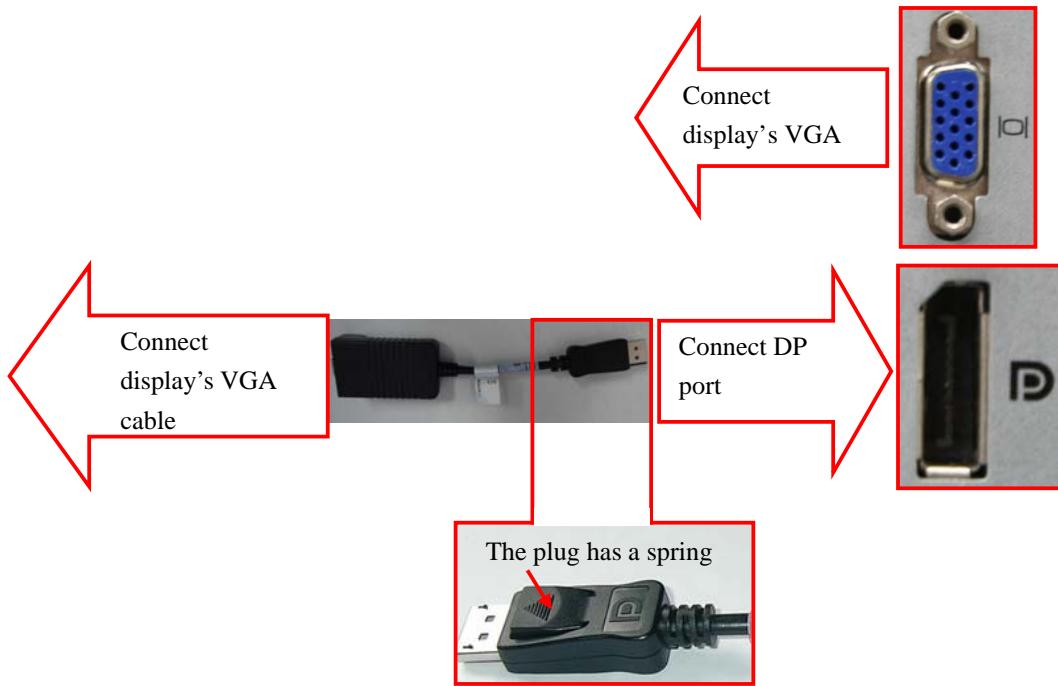
3.3 Display Hardware Installation

3.3.1 Implementing Double Screen Display by DP-to-VGA Adapter

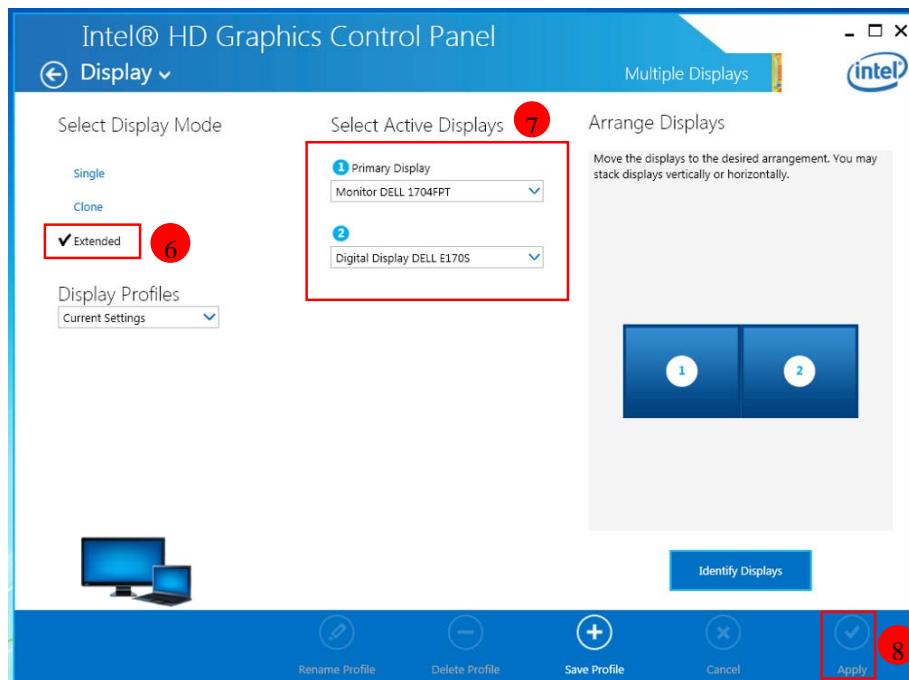
Adapter

The double screen display in the CMS can be achieved by DP-to-VGA adapter:

1. Shut down the computer first.
2. Then connect two screens by DP-to-VGA adapter:



3. When the display is connected, power on the PC.
4. Right click the mouse on the desktop, and then select “Graphics Properties...” from the pop-up menu.
5. In the “Intel ® HD Graphics Control Panel” window, click “Display” → “Multiple Displays” to enter the “Multiple Displays” window, as shown in the following figure.



6. In the “Select Display Mode” field, select “Extended”.

-
7. In the “Select Active Displays” field, set the primary display to “Monitor ***”; set the second display to “Digital Display***”.
 - ◆ “Monitor ***” refers to the display directly connecting the VGA interface of the PC.
 - ◆ “Digital Display***” refers to the display connecting the VGA by DP-to-VGA adapter.
 8. Click the “Apply” option. The message “The new settings have been applied. Do you want to keep these settings?” displays.
 9. Click the “Yes” button to apply the setting.
 10. Click the  icon to close the window.

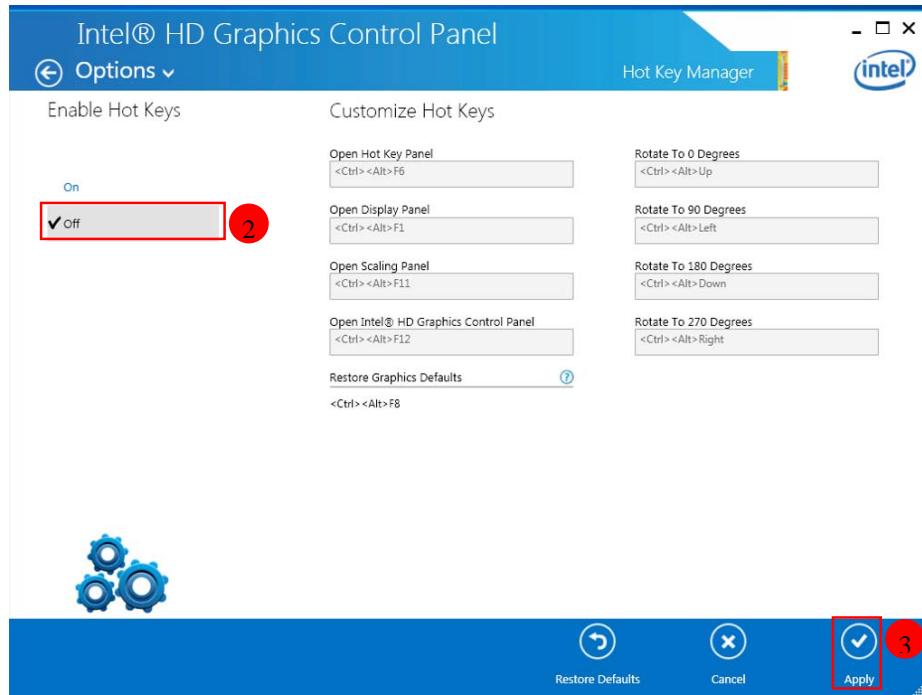
NOTE

- When unplugging the DP-to-VGA adapter, press the spring button on the DP plug and then unplug it downward. Failure to do so may damage the DP plug.



3.3.2 Cancelling the Hot Keys

1. To avoid the user error operation, follow the procedure to cancel the functional hot keys:
2. Enter the “Intel ® HD Graphics Control Panel” window, and then click the “Options” option to display the “Hot Key Manager” window, as shown in the following figure.



3. In the “Enable Hot Keys” field, click the “Off” option.
4. Click the “Apply” option to apply the setting. The message “The new settings have been applied. Do you want to keep these settings?” displays.
5. Click the “Yes” button to apply the setting.
6. Click the icon to close the window.

3.3.3 Setting My Main Display

To make the desired screen as main display, follow this procedure:

1. Right click the mouse on the desktop, and then select “Screen resolution” from the pop-up menu to display the window, as shown in the following figure.

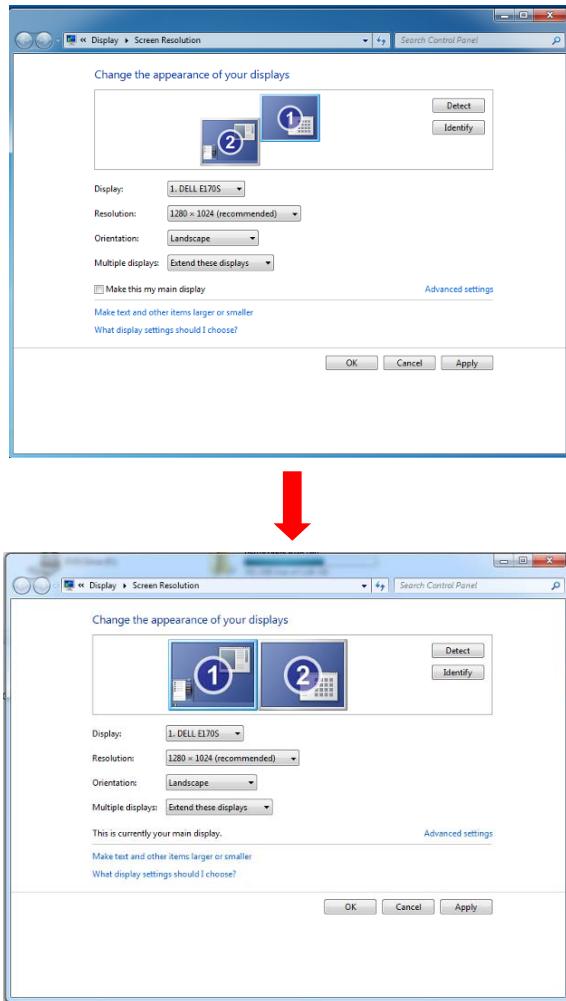


2. In the screens displaying list box, select the desired screen.
3. Select the “Make this my main display” option.
4. Click the “OK” button to save the setting and close the window.

3.3.4 Aligning the Double Screens

When the alignment between the screens is ragged, follow this procedure to align the screens at the same horizontal line:

1. Right click the mouse on the desktop, and then select “Screen resolution” from the pop-up menu to display the window, as shown in the following figure.



2. Click the screen signed with number 1 to select it, and then drag the screen down until the screen signed with number 1 aligns with the screen signed with number 2.
3. Click the “OK” button to save the setting and close the window.

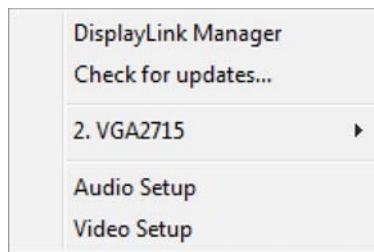
You can refer the above steps to adjust the multi-screens alignment.

3.3.5 Installing Multi-Screen Extend Device (SUNIX VGA2715)

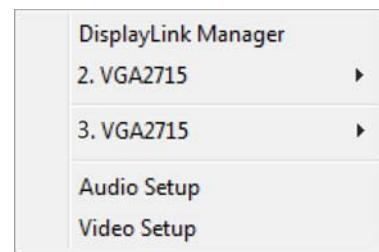
1. Take out the accompanying USB cable. Connect one end of the cable with the connector of SUNIX VGA2715, and the other end with the CMS.
2. Place the SUNIX VGA2715 driver CD in the CMS drive. Double click the driver in the CD and install by default configuration. The following icon will display in menu bar on the lower right corner of screen when installation is complete.



3. Connect the VGA cable of display with SUNIX VGA2715. Right click VGA2715 icon in the menu bar. When the CMS are equipped with three or four displays, the following menu will pop up.

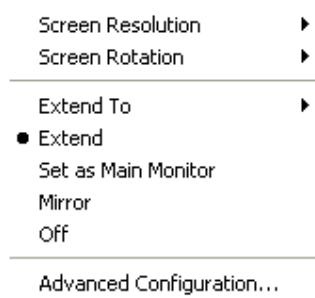


Three Display Menu

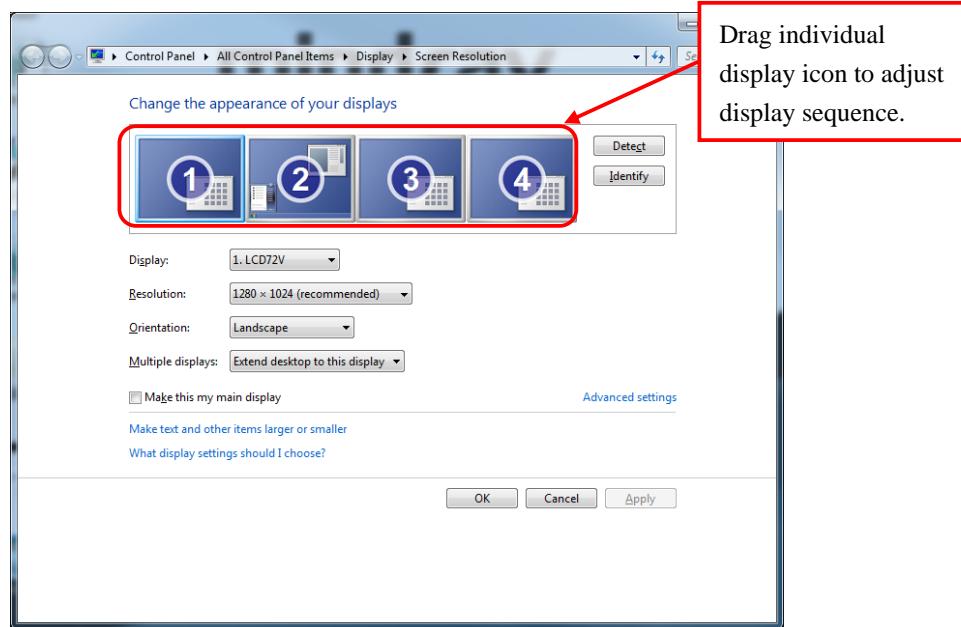


Four Display Menu

4. Select the arrow to open the submenu.
5. Select the option of “Extend” in the corresponding submenu. Then the extension of the screen is done.

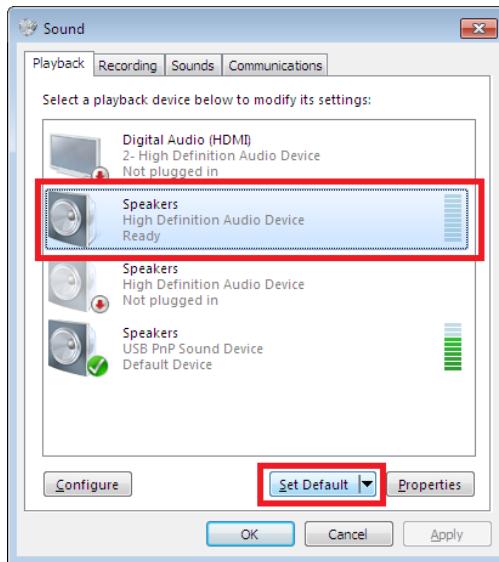


6. To adjust the display sequence, select the option of Advanced from the pop-up menu or sub-menu. The following Display Properties window will show. Set the sequence in the “Settings” tab. Click “Apply” to save your settings.



3.3.6 Setting the Audio Properties (T100 Extend Device Only)

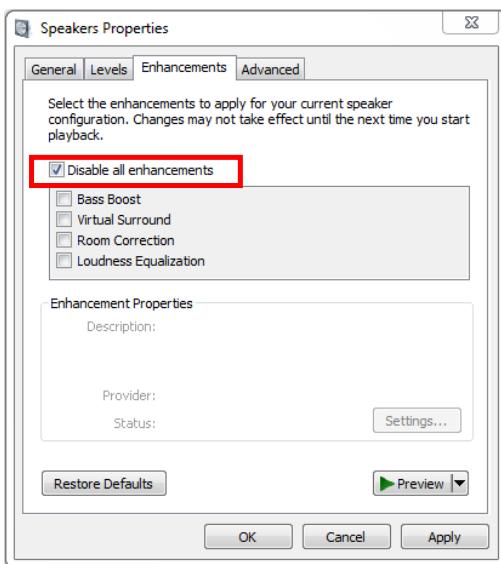
1. Open “Control Panel”, and then select “Hardware and Sound”.
2. Select “Sound”. The “Sound” window will display.
3. In the “Playback” tab, select the operating system speaker and then select “Set Default” button, shown as below.



4. Restart PC when the above installation is done. Verify that the display effect meets the requirement.

3.3.7 Disabling the Audio Enhancement

1. Open “Control Panel”, and then select “Hardware and Sound”.
2. Select “Sound”. The “Sound” window will display.
3. In the “Playback” tab, select the operating system speaker and then right click the mouse.
4. In the pop-up menu, select “Properties”.
5. In the pop-up “Speaker Properties” window, select the “Enhancements” tab.
6. Select “Disable all enhancements”, shown as below.



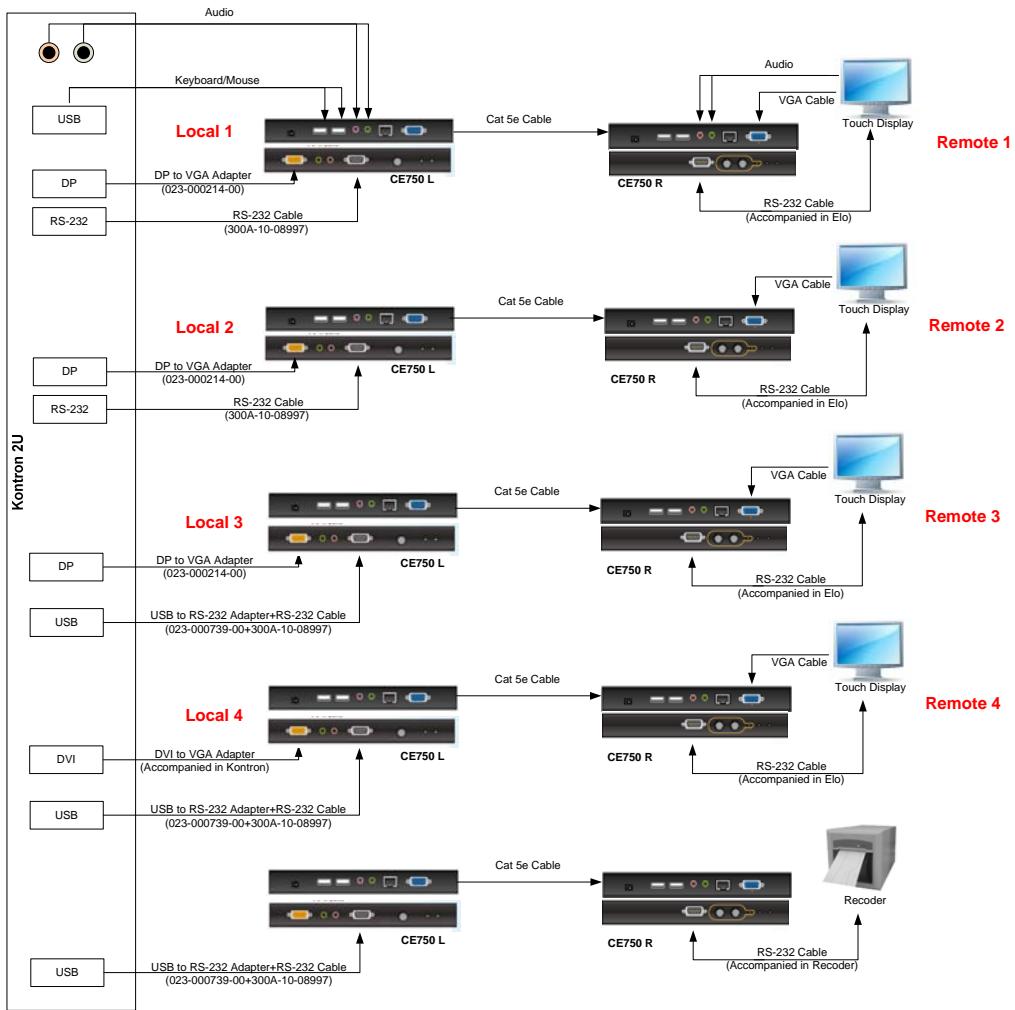
7. Select “Ok”.

3.3.8 Installation for Remote Display, Keyboard/Mouse, Audio

The CMS supports the remote display, audio, and keyboard/mouse operation with the source from local CMS. The installation is illustrated on the Kontron KISS 2U (023-001020-00) host.

Tools Required:

- KVM extender (CE750R, CE750L) 023-000773-00
- DP-to-VGA adapter 023-000214-00
- USB-to-VGA adapter 023-000766-00
- RS-232 cable 300A-10-08997
- USB-to-RS232 adapter 023-000739-00



-
1. Connect the Local 1 devices to CE750L.
 - a. Connect one end of the DP-to-VGA adapter to the DP1 port of Kontron KISS 2U host.
 - b. Connect the yellow end of the CE750L accompanying cable to the CE750 input port.
 - c. Connect the VGA port of the CE750L accompanying cable to the DP-to-VGA adapter.
 - d. Connect one end of the RS-232 cable to the RS-232 port of the Kontron KISS 2U host, and the other end to CE750L.
 - e. Connect the USB port of the CE750L accompanying cable to the USB connector of Kontron KISS 2U host.
 - f. Connect the audio port of the CE750L accompanying cable to the audio port of the Kontron KISS 2U host.
 2. Connect the Remote 1 devices to CE750R.
 - a. Connect the RS-232 port of touchscreen to the RS-232 port of CE750R by the touchscreen accompanying cable.
 - b. Connect the VGA port of touchscreen with the VGA port of CE750R by the touchscreen accompanying cable.
 - c. Connect the audio port of touchscreen with the audio port of CE750R by the touchscreen accompanying cable.
 - d. Connect the keyboard and mouse to the USB port of CE750R.
 3. Connect the Local 2 devices to CE750L.

Repeat the operation a-d of Step 1.
 4. Connect the Remote 2 devices to CE750R

Repeat the operation a-c of Step 2.
 5. Connect the Local 3 devices to CE750L.
 - a. Repeat the operation a-c of Step 1.
 - b. Connect one end of USB-to-RS-232 adapter to the USB port of Kontron KISS 2U host, the other end to RS-232 cable.
 - c. Connect the RS-232 cable to CE750L.
 6. Connect the Remote 3 devices to CE750R.

Repeat the operation a-c of Step 2.

7. Connect the Local 4 devices to CE750L.
 - a. Connect the DVI-to-VGA adapter to DVI port of Kontron KISS 2U host.
 - b. Connect the VGA port of the CE750L accompanying cable to the DVI-to-VGA adapter.
 - c. Connect one end of USB-to-RS-232 adapter to the USB port of Kontron KISS 2U host, the other end to RS-232 cable.
 - d. Connect the RS-232 cable to CE750L.
 8. Connect the Remote 4 devices to CE750R.
- Repeat the operation a-c of Step 2.
9. Connect CE750L to CE750R by a network cable.
 10. Install touchscreen driver. Refer to **3.8 Installing Elo Touchscreen Driver (Optional)**.

CAUTION

-
- If recorder is extended for remote operation, the serial port of CE750L must be connected to the COM1 port of Kontron KISS 2U.
 - If paging is extended for remote operation, the serial port of CE750L must be connected to the COM2 port of Kontron KISS 2U.
 - The touchscreen driver is installed only after all the connections are complete.
-

NOTE

- The CMS supports VGA video extension. The recommended equipment is ATEN KVM Extender CE750.
 - The remote display equipment is required to support a resolution of 1280×1024 pixels.
 - Please refer to the accompanying documents for the detailed operations, installation, specifications and precautions of VGA video transmission equipment.
 - The CE750 KVM extender does not support remote USB storage. To support the remote USB storage, you need install a USB extender.
-

3.4 IP Address Setup and Network Connection

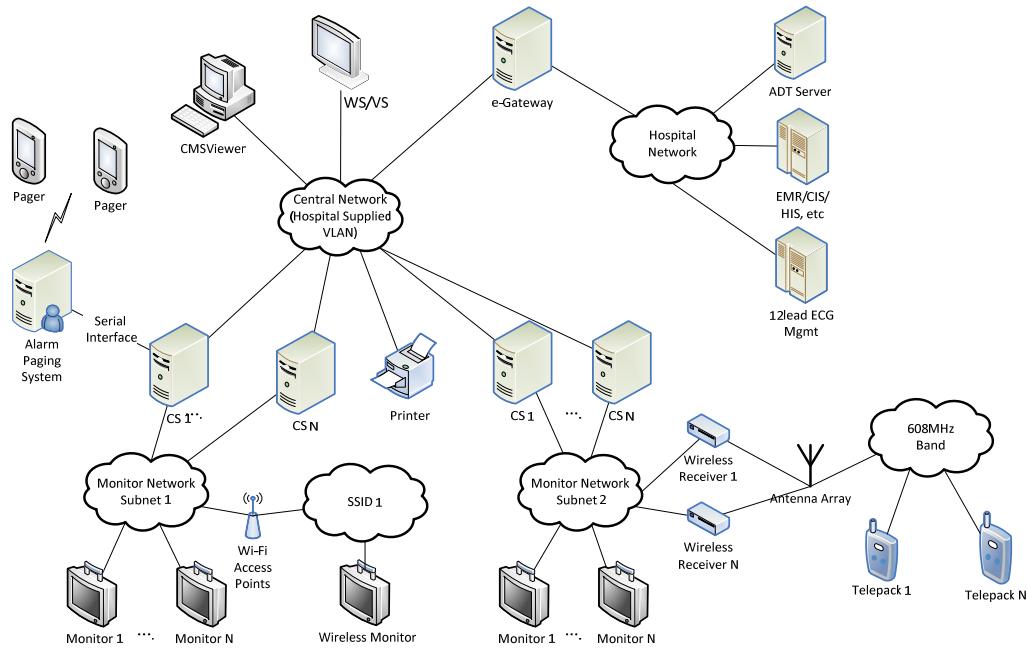
The PC will be equipped with two network adapters to isolate the monitor LAN and the external network to ensure network bandwidth and data safety for the monitors.

NOTE

- If two network adapters are used, be sure to identify which is for monitor network and which is for external network connecting multiple CMS, CMS viewer or other information systems. Correctly set IP address for each network adapter.
- If two network adapters are used, connect them to corresponding networks as desired.
- Do not connect both network adapters to the same network segment, e.g., do not connect them to the monitor network at same time.

3.4.1 Network Connection Using Multiple Network Adapters

The figure below shows the network connection using multiple network adapters.



As shown in the figure, the two network adapters are respectively connected to the monitor LAN and the external network.

3.4.1.1 Supported Monitoring Device

Bedside Monitors

Passport 12M/17M	Passport 8/12	Accutorr 7
T1	DPM 3/4/5/6/7	V 12/21
Spectrum	Spectrum OR	Passport 2
Passport V		

Telemetry

TMS-6016	TMS60	Telepack-608
----------	-------	--------------

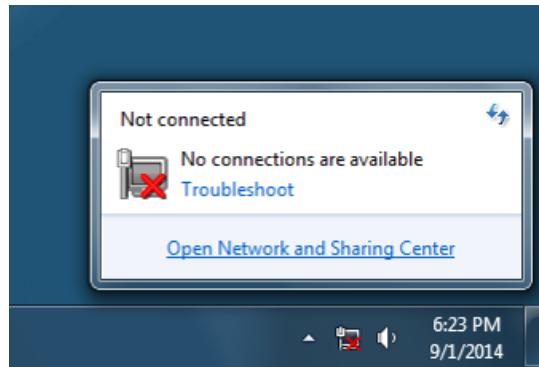
3.4.2 Monitor LAN

NOTE

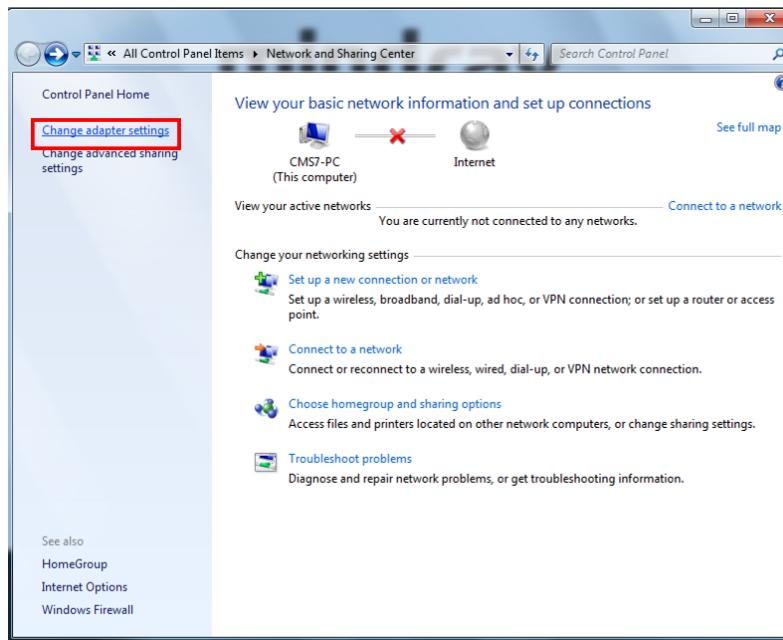
-
- If two network adapters are used, the one (hereinafter called integrated network adapter) integrated on the PC main board is normally connected to the monitor network and the one (hereinafter called independent network adapter) installed in the PCI slot is connected to the external network.
 - The default network adapter is the integrated network adapter, which is used for the patient network using CMS+ protocol only.
 - For CMS+ protocol, use IP address scheme **196.76.0.xxx** and subnet mask **255.255.0.0**.
 - Every IP Address on each individual network has to be unique. Duplicate IP Addresses will cause network connection failures.
 - The hospitals can set their own desired DHCP or IP addresses. However, the CMS IP address must not be changed.
-

To set the IP addresses of the integrated network adapter:

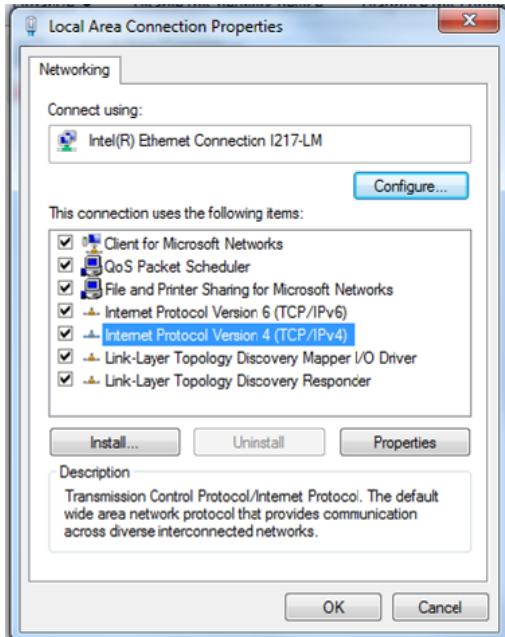
1. Select the  icon at the bottom of the screen to enter the following screen. Then click “Open Network and Sharing Center”.



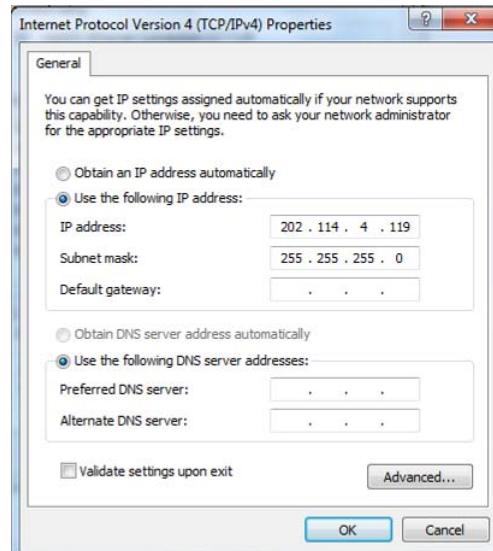
2. In the pop-up screen, select “Change adapter settings”.



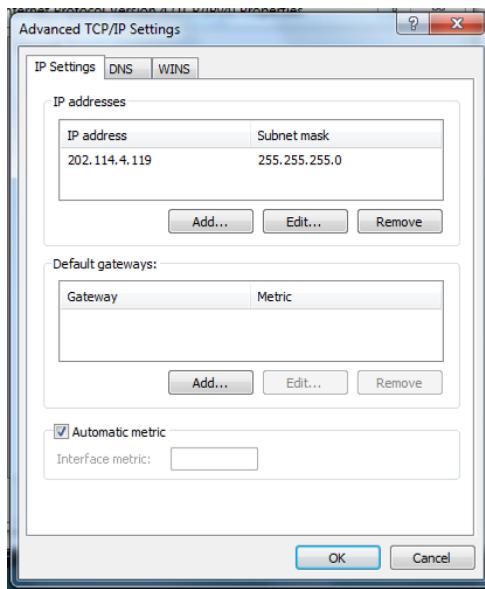
3. After accessing the Network Connection screen, right click “Local Area Connection”.
4. In the “Local Area Connection Properties” screen, double click “Internet Protocol version 4 (TCN/IPv4)”.



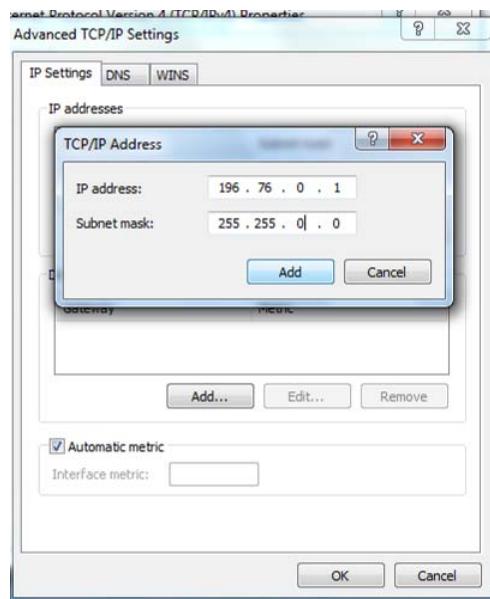
5. In the “Internet Protocol Version 4 (TCP/IPv4) Properties” screen, set an IP address (The address in the following figure is used for reference only).



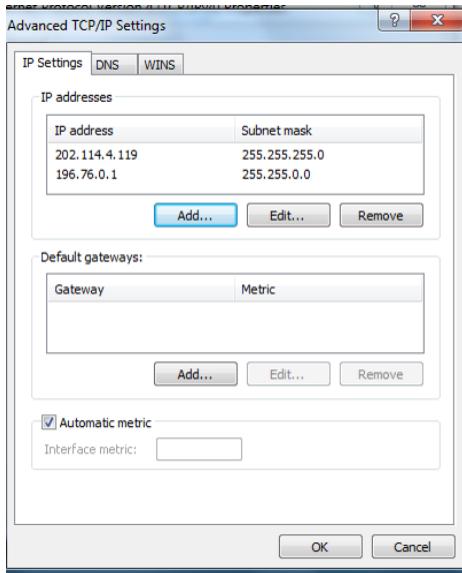
6. If you need to configure more IP addresses, select “Advanced” (see the figure above), you will see the following screen display:



7. Click “Add...” in the “IP Settings”, and then you will see the following screen display:



8. Click “Add” to return to the following screen display. To add more IP addresses, repeat Step 7.



- Click “OK” to finish setting IP address.

3.4.3 External Network

The independent network adapter is used to connect the external network. Its IP address should be configured according to actual use.

The external network is required when:

- Other information systems are connected;
- Patients of different CMS are viewed;
- Local CMS is remotely viewed using a CMS Viewer;
- Routers are used.

IP Address Setup

To implement the Remote CMS function between CMS, each CMS needs to be equipped with at least two network adapters, one of which is for internal communication within the current CMS and the other for inter-communication between the CMS. The typical configuration is shown below:

Current CMS A		Target CMS B		Target CMS C	
Network adapter A1	Network adapter A2	Network adapter B1	Network adapter B2	Network adapter C1	Network adapter C2
196.76.0.X1	168.168.4.X2	196.76.0.Y1	168.168.4.Y2	196.76.0.Z1	168.168.4.Z2

As shown in the table above, network adapter A1, B1 and C1 are used for the communication between the CMS and the monitors. Their IP addresses are in the same network segment with

the IP addresses of respective monitors. Network adapter A2, B2 and C2 are used for the inter-communication between the CMS. Their IP addresses belong to the same network segment and X2, Y2 and Z2 shall be different.

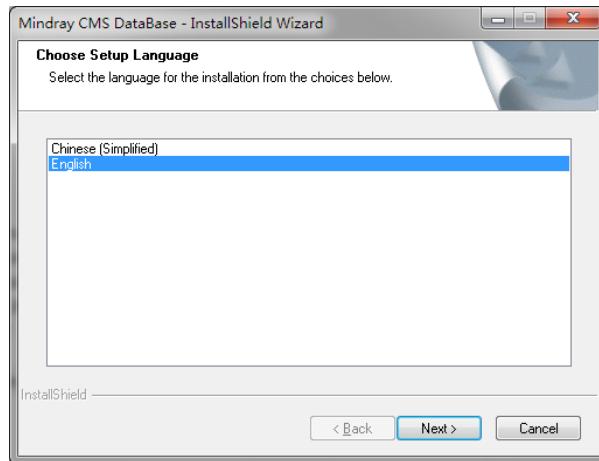
NOTE

- If a CMS needs to implement the Remote CMS function on other CMS, other CMS has to connect to the monitoring network. Please refer to CMS operator's manual for details.
-

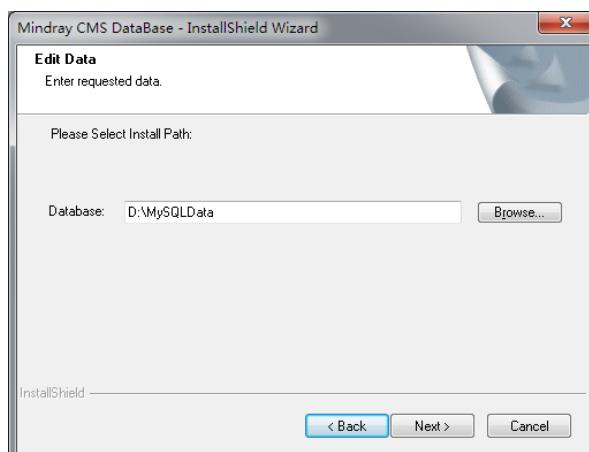
3.5 Database Software Installation

Insert the CMS software CD, then go to the directory “MySQL Community Server” and install by following the steps.

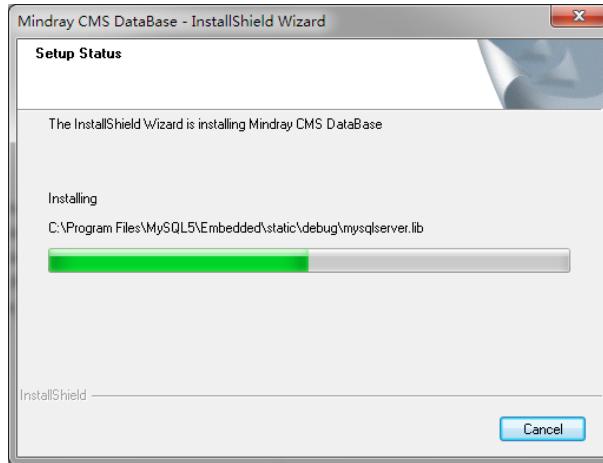
1. Double click MySQLInstall.exe, and the following “Choose Setup Language” screen will be displayed:



2. Select a desired language and click “Next” button till the following screen is shown:

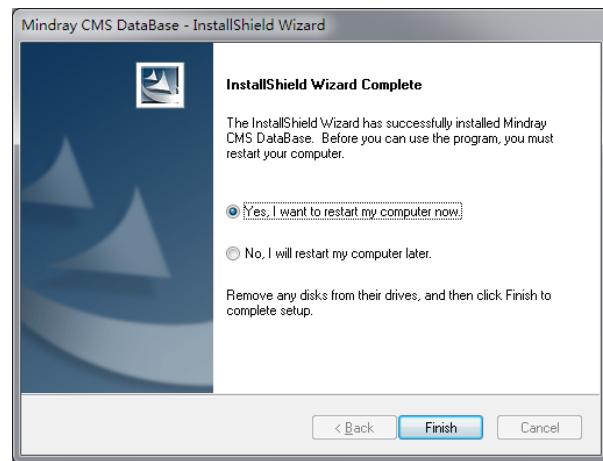


Since the data of database is saved under this directory, make sure that the disk in which the directory is located can read-write and provide enough space. When the selection is completed, click “Next” button until the following screen is shown:



3. Complete installation and restart the PC

When the following screen is shown, it indicates that the database software installation is complete. Select as the following screen shows and then click the “Finish” button. The computer will restart automatically.



3.6 Printer Installation

3.6.1 Supported Printers

The CMS supports the following printers:

- HP LaserJet M401n
- HP LaserJet M602
- HP LaserJet M605n

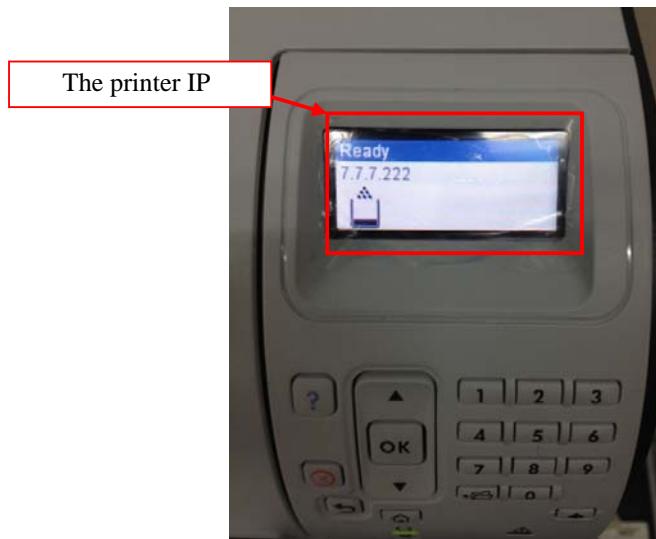
3.6.2 Printer Installation Procedures

Using the installation of HP LaserJet M602 as an example:

Insert the printer driver CD into the CD-ROM

Verifying the Printer IP:

1. Load the printer with paper and connect with the computer (Set the printer IP address to 196.76.0.X).
2. Power on the printer. The printer IP address information will be shown on the screen of the control panel as below:



3. Verify this IP address is in the same network segment as the patient network. If not, add a new computer TCP/IP address so that it is in the same network segment with the printer IP address.

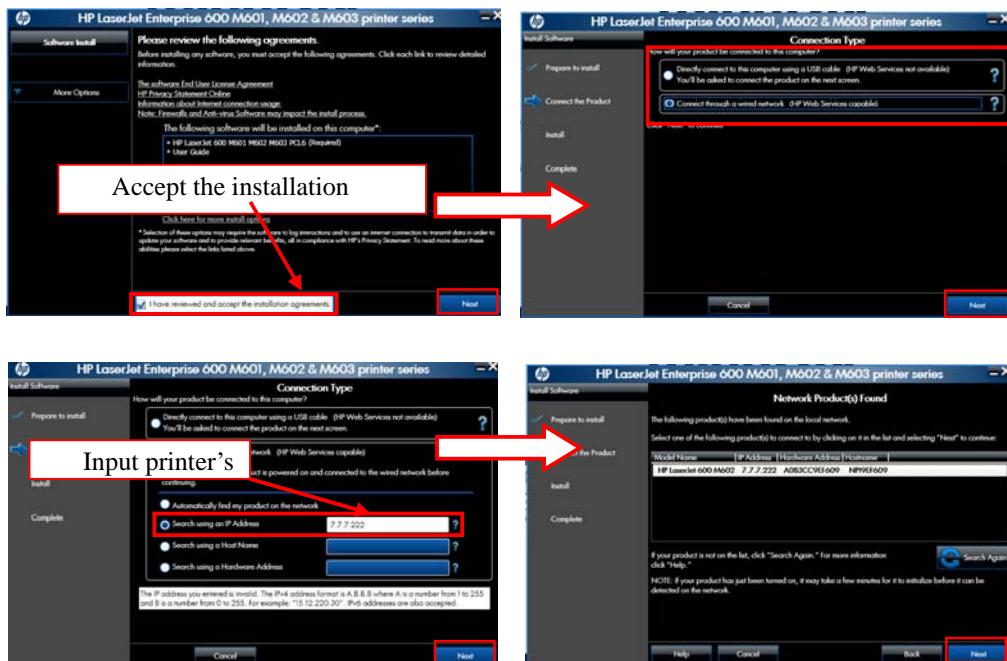
Adding TCP/IP

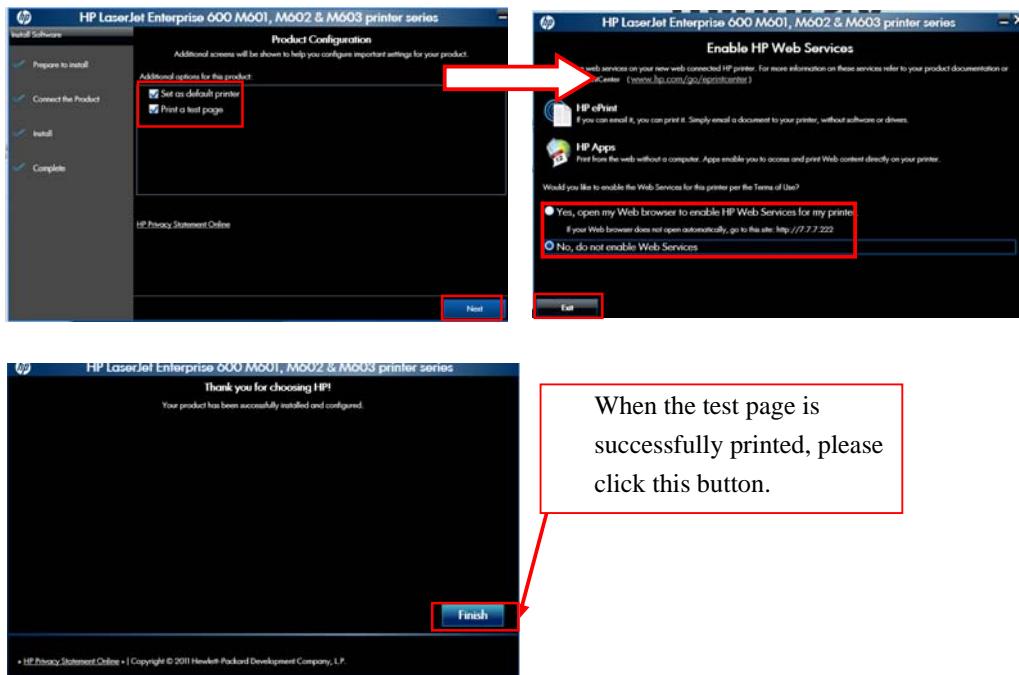
1. Enter the Windows desktop and select “Start” → “Control Panel” → “Network and Internet” → “Network and Sharing Center” → “Change adapter settings” to display the network connection window.
2. Double-click the “Local Area Connection” icon to display the “Local Area Connection Status” window.
3. Click the “Properties” button to display the “Local Area Connection Properties” window.
4. Select the desired device from the “This connection uses the following items” list box, and then click the “Properties” button to display the “Internet Protocol Version 4 (TCP/IPv4) Properties” window.

5. Select the “Use the following IPv4 address” option, and then click the “Advanced...” button to display the “Advanced TCP/IP Setting” window.
6. Select the “IP Settings” tab, and then click the “Add...” button to display the “TCP/IP Address” window.
7. Input an IP address that is in the same network segment with the printer IP address. Click the “Subnet mask” input box, the default subnet mask displays.
8. Click the “Add” button to add the IP and close the “TCP/IP Address” window.
9. Click the “OK” button to save the setting and close the “Advanced TCP/IP Setting” window.
10. Click the “OK” button to save the setting and close the “Internet Protocol Version 4 (TCP/IPv4) Properties” window.
11. Click the “OK” button to apply the setting and close the “Local Area Connection Properties” window.
12. Click the “Close” button to close the “Local Area Connection Status” window.

Installing the network printer

1. Insert the printer driver CD into the CD-ROM.
2. Right click the mouse to run CD driver, and then double click “setup.exe” file in the root directory.
3. Install the driver by following the indications shown below in the order of from left to right and from top to bottom:





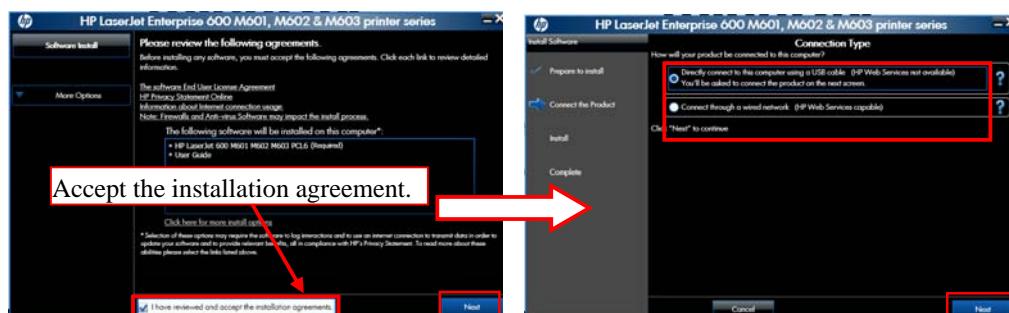
4. After test page is printed, close all the pop-up windows and access “Printers and Faxes”.
5. Select “HP LaserJet 600 M601 M602 M603 PCL6” printer and re-name it as “M602_net” to complete installation of printer’s network driver.

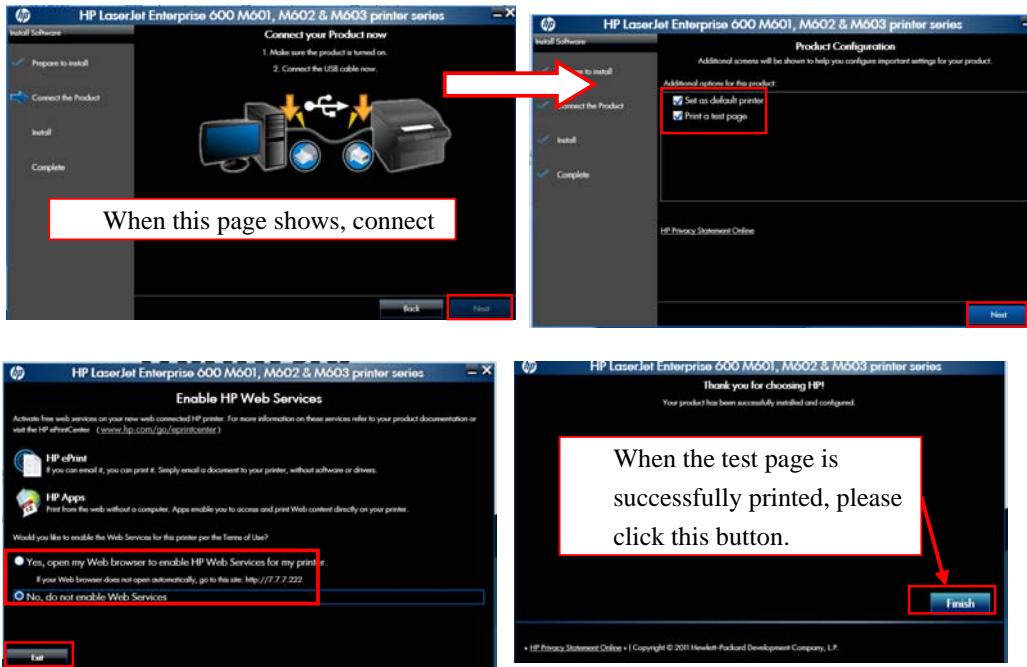
Installing the USB printer

NOTE

- Make sure that the USB cable of the printer is not connected with computer.

1. Right click the mouse to open CD driver, and then double click “setup.exe” file in the root directory.
2. Install the driver by following the indications shown below in the order of from left to right and from top to bottom:





3. After test page is printed, close all the pop-up windows and access “Printers and Faxes” again.
4. Select “HP LaserJet 600 M601 M602 M603 PCL6” printer and re-name it as “M602_usb” to complete installation of printer’s USB driver.

NOTE

- When installing a printer, select to install network driver or USB driver based on the actual requirement. Connect the printer to the CMS network if network printing is needed.

3.6.3 Tasks after Printer Installation

To improve the print effect, follow the steps as below:

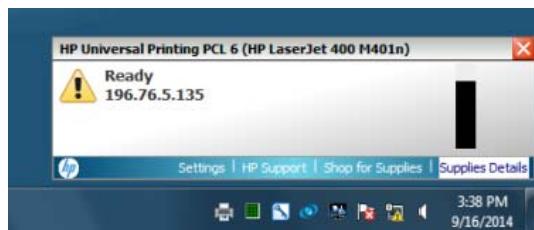
1. Enter the Windows desktop and select “Start” → “Control Panel” → “Hardware and Sound” → “Devices and Printers”.
2. In the “Printers and Faxes” field of the “Devices and Printers” window, select the desired printer and right click the printer.
3. Click the “Printer properties” option from the pop-up menu to display the printer properties window.
4. Click the “Advanced” tab.
5. Unselect the “Enable advanced printing features” option.

-
6. Click the “OK” button to apply the setting and close the printer properties window.

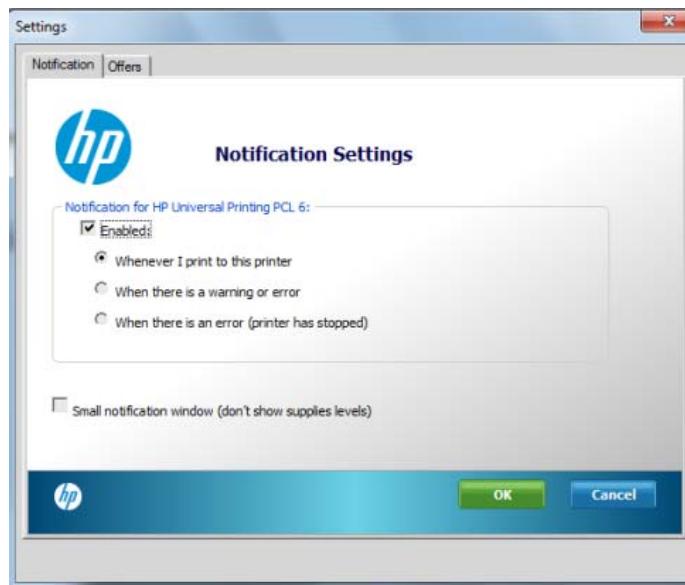
To block the pop-up functional window when running the CMS, follow the steps as below:

1. After install the printer, implement a printing task.

A prompt window displays at the bottom-right of the desktop, as shown in the following figure.



2. Click the “Supplies Details” option to display the “Settings” window, as shown in the following figure.



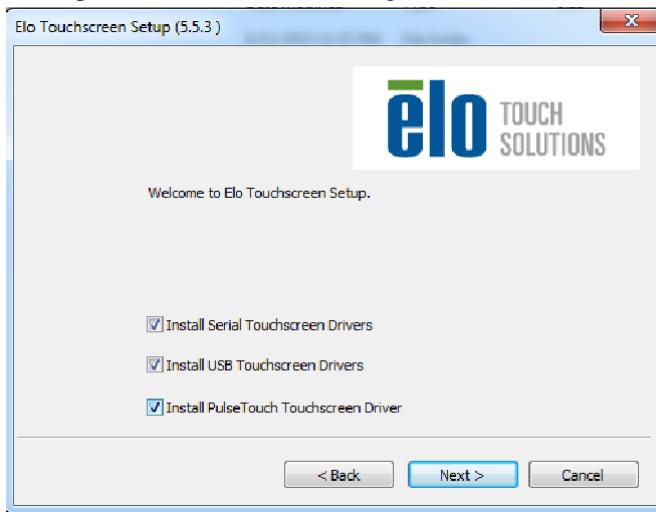
3. Click the “Notification” tab, and unselect the “Enabled:” check box.
4. Click the “Offers” tab, and unselect the “Allow special device information and offers to be displayed” check box.
5. Click the “OK” button to apply the settings and close the “Settings” window.

3.7 Recorder Installation

No recorder driver is needed. Recording can function directly after system software is installed.

3.8 Installing Elo Touchscreen Driver (Optional)

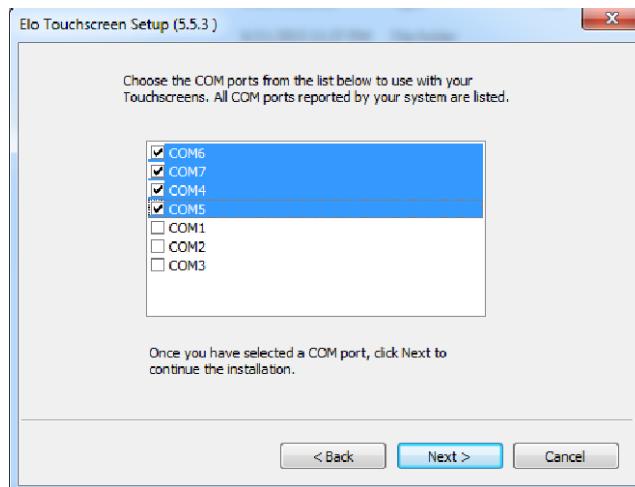
1. Insert the Elo touchscreen driver CD and run the file “Setup.exe” .
2. Select the desired language, and then select “Next >”.
3. Select all the options, shown in the following screen.



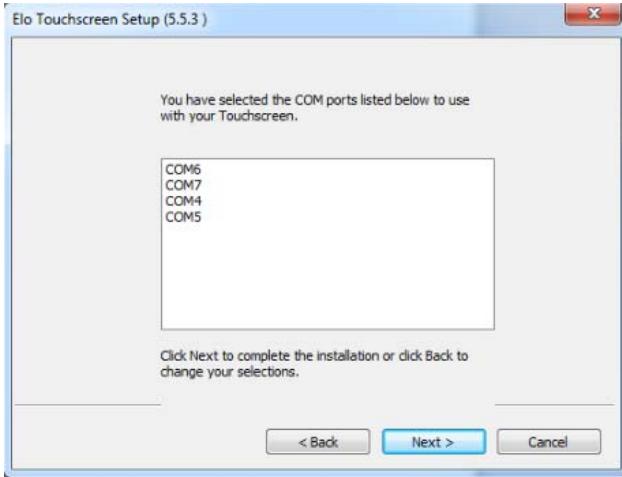
4. In the License Agreement screen, select “Yes”.
5. Select “Auto-detect Elo Touchscreens”, and then select “Next>”.
6. Select the proper COM ports, shown in the following screen, and then select “Next>”.

NOTE

- The COM3 is not intended for touchscreen connection.
- By default, the COM1 port is for recorder connection, and the COM2 port for paging system. If these devices are to be installed, the COM1 and COM2 ports should not be selected for touchscreen.



7. The COM ports list displays, shown in the following screen. Select “Next>”.



8. Select “Calibrate Elo Touchscreen monitors.”, and then select “Finish”.
9. Calibrate the touchscreen according to the screen prompts.

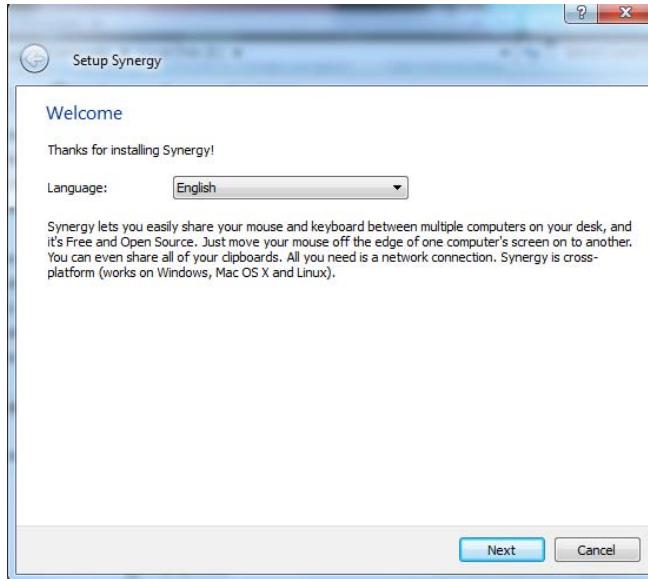
3.9 Installing Synergy Software (Optional)

Synergy is a software application for sharing a keyboard and mouse between multiple computers.

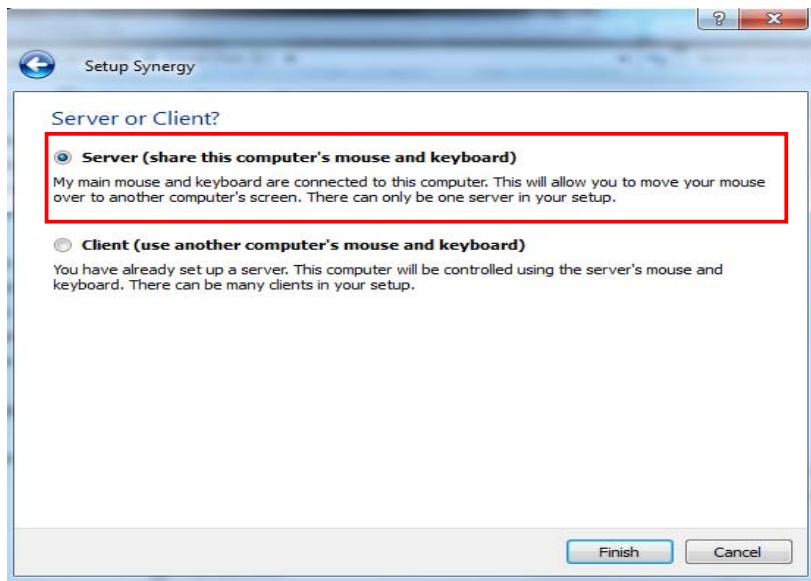
The installation process includes server and client installation.

3.9.1 Installing and Configuring a Server

1. Insert the BeneVision CMS Tool SW CD (P/N 115-034052-00) into the computer CD drive, and find the Synergy software application (P/N 110-003997-00) in the CD.
2. Run “synergy1.6.3.exe”.
3. In the welcome screen, select “Next”.
4. In the End-User License Agreement screen, select “I accept the terms in the License Agreement” and then select “Next”.
5. Always select “Next” until the installation is complete. The Synergy application automatically starts after the installation is complete.
6. In the following screen, select the proper language and then select “Next”.

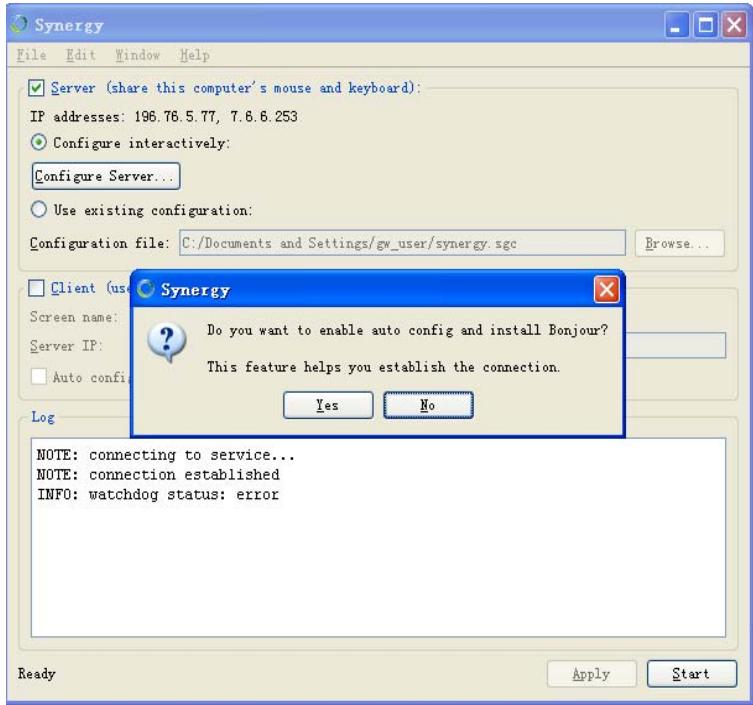


7. Select “Server (share this computer’s mouse and keyboard)”, and then select “Finish”.

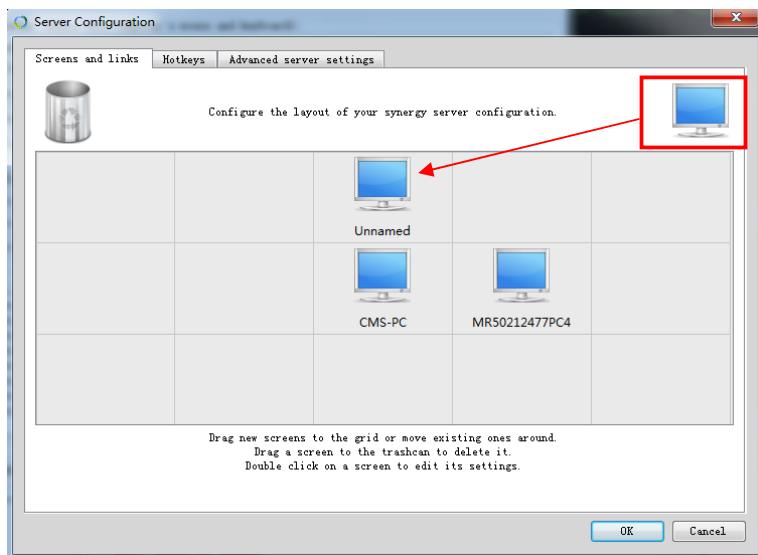


8. After entering the following screen, a window showing “Do you want to enable auto config and install Bonjour? This feature helps you establish the connection” will pop up. Select “No”. Select “Configure Server...”.

By default, “server (share this computer’s mouse and keyboard)” and “Configure interactively” are selected.



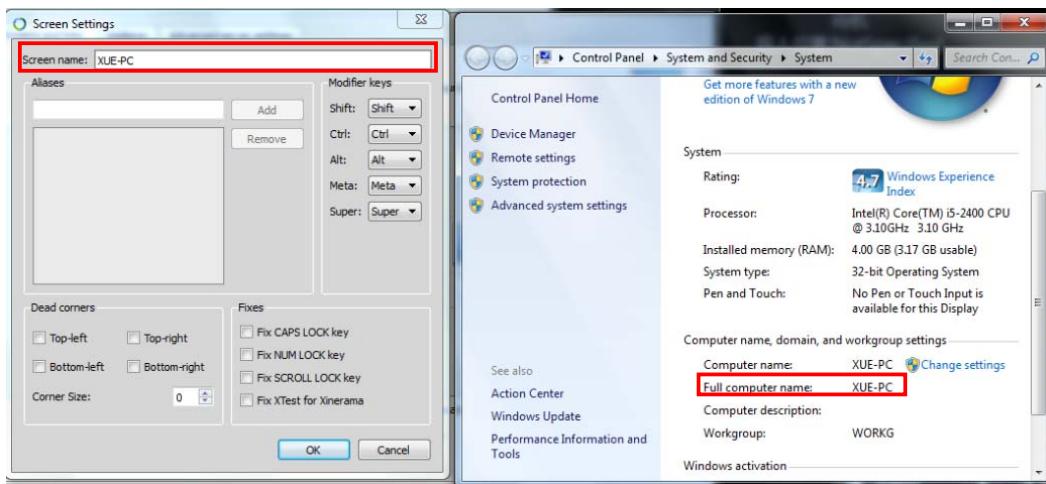
9. In the “Screens and links” tab of Server Configuration, drag the computer icon on the upper left corner of screen to a proper position in the grid. Then an unnamed icon appears in the grid, shown as below.



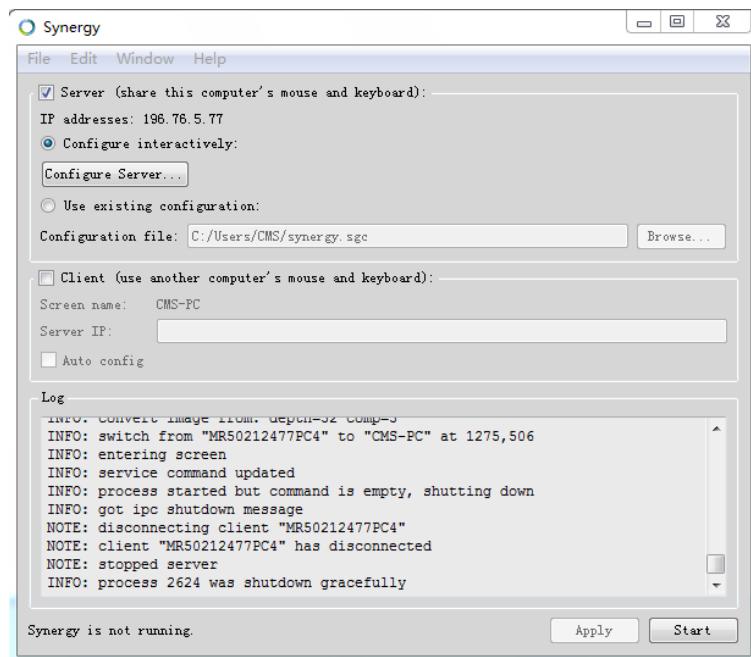
NOTE

- The actual computers should be placed in accordance with the position in the grid.

10. Double click the computer icon, the “screen settings” screen displays. Enter the computer name in the field of “Screen name” according to the client computer name, and then selected “Ok”.

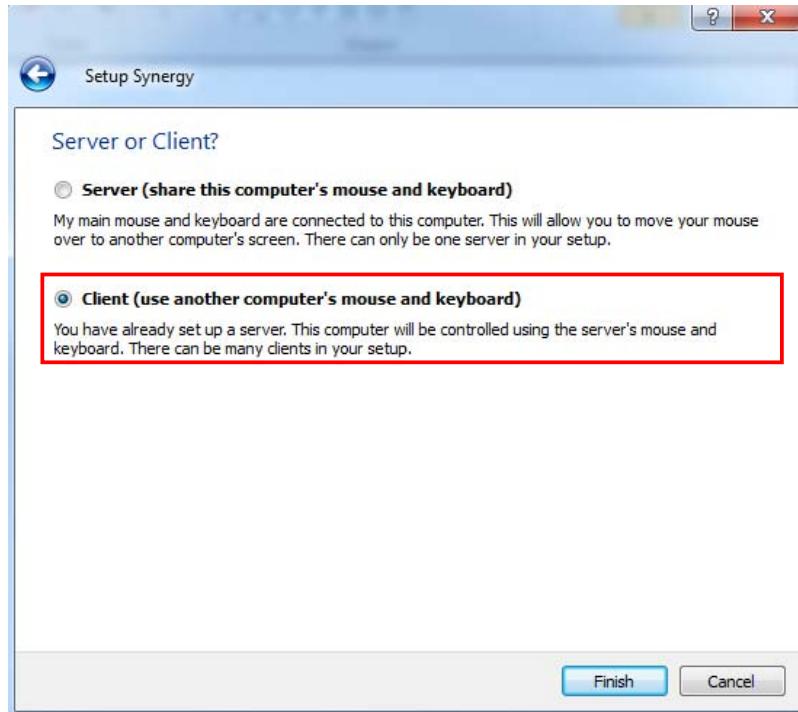


11. In the following screen, select “Start”.



3.9.2 Installing a Client

1. Do the step 1-6 in the section *3.9.1 Installing and Configuring a Server*.
2. Select “Client (share this computer’s mouse and keyboard)”, and then select “Finish”.



3. After entering the following screen, a window showing “Do you want to enable auto config and install Bonjour? This feature helps you establish the connection” will pop up. Select “No”. Select “Configure Server...”.
By default, “client (use another computer’s mouse and keyboard)” is selected.
4. Select “Start”.

3.10 Installation of the CMS Software

3.10.1 Setting the Region and Language of the Operating System

If the language used by the current operating system is the same language the user wants to display on the CMS, it is unnecessary to set the region and language for the operating system. In this case, skip this step.

If the language of the operating system is English but the user requires a non-English interface for the CMS, it is necessary to set the region and language of the operating system. To set the region and language, follow this procedure:

1. Enter the Windows desktop and select “Start” → “Control Panel” → “Clock, Language, and Region” to enter the “Clock, Language, and Region” window.
2. Click the “Region and Language” option to display the “Region and Language” window.
3. Click the “Format” tab, and then select the desired language (locale) from the “Format” drop-down list.
4. Click the “Location” tab, and then select the desired language (locale) from the “Current location” drop-down list.
5. Click the “Administrative” tab, and then click the “Change system locale...” button to display the “Region and Language Settings” window.
6. Select the desired language (locale) from the “Current system locale” drop-down list.
7. Restart the computer to apply the setting.

3.10.2 Setting Operating System Time

1. Enter the Windows desktop and select “Start” → “Control Panel” → “Date and Time” to display the “Date and Time” window.
The current tab displays the “Date and Time” tab.
2. Click the “Change time zone...” button to display the “Time Zone Settings” window.
3. Select the “Automatically adjust clock for Daylight Saving Time” option.
4. Click the “Internet Time” tab.
5. Click the “Change settings...” button to display the “Internet Time Settings” window.
6. Unselect the “Synchronize with an Internet time server” option.
7. Restart the computer to apply the setting.

3.10.3 Installing the CMS System Software

NOTE

- Insert the USB dongle before installing the system software.
 - The software version of the USB dongle must match the version of CMS.
 - Connect the network cable. The independent network adapter needs to connect to network. Refer to *3.4 IP Address Setup and Network Connection* for additional information of independent network adapter.
-

1. In the CMS software CD, double click “Setup.exe” under the “Setup” directory to enter the following window.



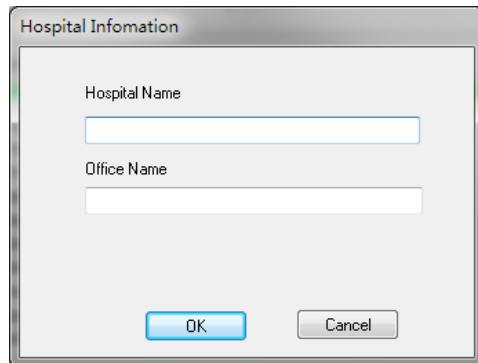
NOTE

- The language selected as shown in the figure above is the one for display on the screen during the process of installation but not the default one when the CMS is operating. The language used when the CMS is operating is to be set up in the following steps.
 - Set OS language to English before installing CMS system software in English or other language operating system. Change to the desired OS language after the installation.
-

2. Select the desired language in the following window, and then click “Ok”.



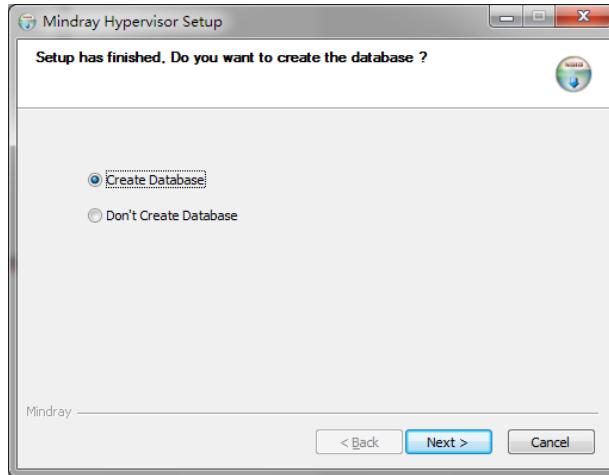
4. Enter hospital name and department name in the following window. Then click “OK”.



5. Select the desired installation type as per the following NOTE:

NOTE

- Selecting “Create Database” will destroy the data in the database. “Create Database” is not required in the case of recovering to install CMS software to save the previous data. “Create Database” is required when the CMS software is installed for the first time.
 - Select "Don't Create Database" if CMS system software rather than database software is reinstalled and the current database file is compatible with the reinstalled system software.
-



6. After restarting the computer, the CMS will run automatically.

3.10.4 Setting the Size of CMS Screen

Access the CMS system, and then select “System Setup” → “Admin Setup”→”Display Setup”→”Screen”. Adjust the screen size of the CMS system in accordance with actual screen size. Restart PC to enable the screen size settings.

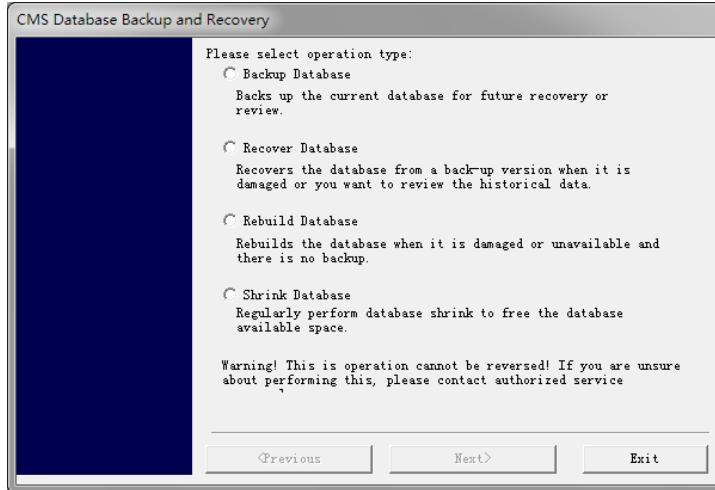
3.10.5 Initial Database Backup

After the CMS is installed, the database needs to be backed up.

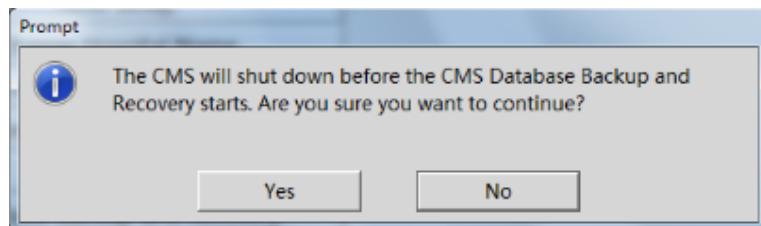
NOTE

- The database can be backed up into the external drive having at least 320GB storage.
 - During database backup, the CMS is shut down.
-

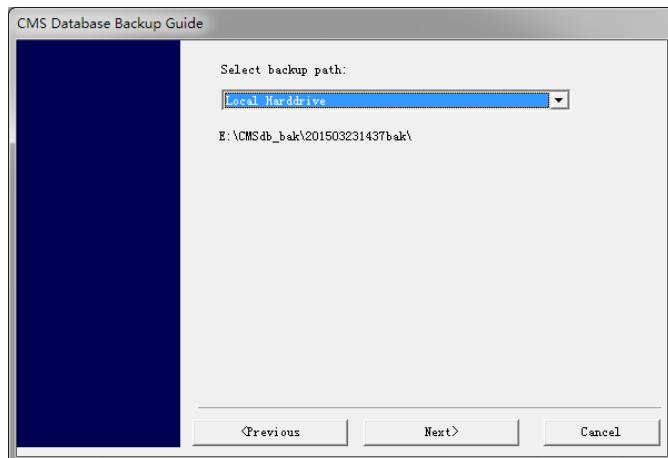
1. Run the CMS. Select “System Setup” → “Admin Setup” (password: 111111)>“Others”, and then click “Database Backup and Recovery” to enter the following window.



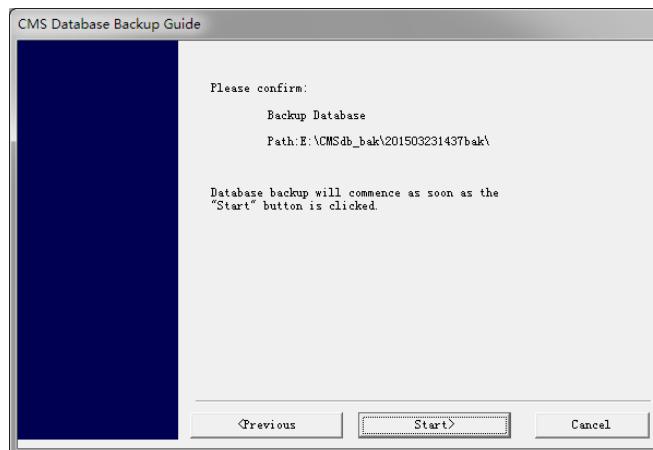
2. Select “Database Backup”. The following window displays.



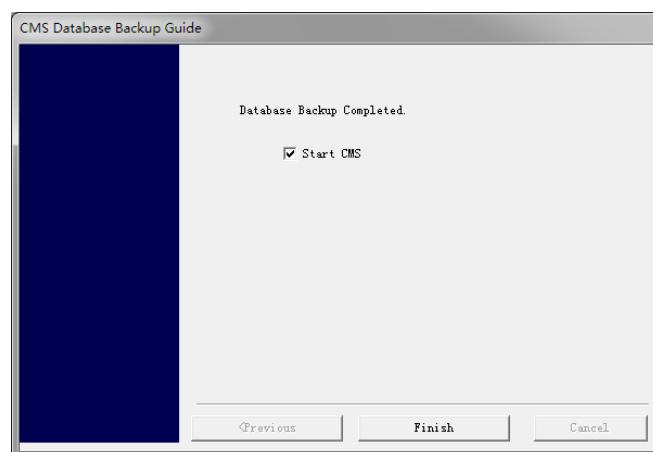
3. Select “Yes”, then the following window displays.



3. Select “Local Hard disk” and then “Next” to enter the following window.



4. Click "Start" to start to back up the database until the following window appears:



NOTE

- The database backup process will take at least 10 minutes. If the database stores a lot of patient data, it could take a long time.
-

5. Click "Finish" to start the CMS.

NOTE

- The above is initial database backup when the CMS is installed. The database at that time does not contain any data. During actual maintenance, it may be necessary to backup database which has saved a large amount of data. If they are backed up onto the hard disk, the old backup will be deleted and only the latest are backed up.
 - When backing up database onto removable storage medium, make sure that the removable storage medium is not infected with virus. Perform virus scanning or formatting in advance.
-

3.11 CMS Software Upgrades

If your CMS software is installed in the Windows XP operating system, but now you need to upgrade the CMS software in the Window 7 operating system, you need do the followings to ensure the CMS' running in the Windows 7 operating system:

1. Format C drive, and re-install Windows 7 Professional Embedded SP1 (32bit)
2. Change the directory “MySQLData” in D drive to “MySQLData_bak”.
3. Run “MySQLInstall.exe” to install MySQL, and then restart the system.
4. Open Windows Task Manager, and end “mysqld.exe” progress.
5. Delete the directory “MySQLData” in D drive, and then change the directory “MySQLData_bak” to be back as “MySQLData”. Then restart the system.
6. Install CMS software. After restarting the computer, the CMS can run normally.

NOTE

- After installing CMS software, do not perform rebuilding database.
-

3.11.1 USB Dongle Compatibility

The upgraded BeneVision CMS software is compatible with the BeneVision dongle. However, some newly added functions may be disabled.

FOR YOUR NOTES

4 About Telemetry Monitoring System (TMS)

The configurations about the TMS are operated at the central monitoring system (CMS), such as programming the telemetry packs, admitting the transmitter, discharging the transmitter from the CMS, refer to

- TMS-6016 Telemetry Monitoring System Service Manual (P/N 046-005121-00)
- TMS60 Telemetry Monitoring System Service Manual (P/N 046-007057-00)

FOR YOUR NOTES

5 McAfee Solidcore S3 Control

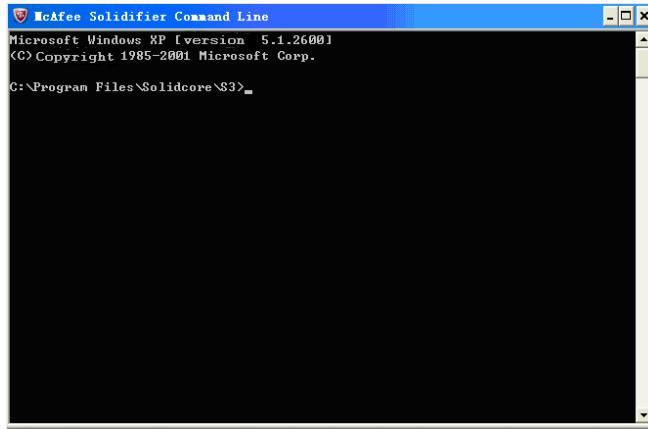
5.1 Installation

For the CMS with Solidcore S3 Control software (Optional), the installation of Solidcore S3 Control will be required.

1. Re-start the CMS host, and access the CMS screen.
2. Start “Windows Task Manager”, and then click the “Processes” tab.
3. End the “Master.exe” process, and then close the “Windows Task Manager” window to return the OS desktop.
4. Insert the McAfee Application Control Software CD (P/N 115-012226-00) into the drive, and then select “SOLIDCOR510-6824_WIN” → “Setup-win2008-win7”.
5. In the “Setup-win2008-win7” folder, right click the “setup-win-7-x86-6.0.0.340” .exe file to display a pop-up menu.
6. Select the “Run as administrator” option to enter the Installation Wizard window.
7. Click the “Next” button.
The “License Agreement” window displays.
8. Select the “I accept the terms in the license agreement” option, and then click the “Next” button.
9. In the “Customer Information” window, input the information as follows:
 - ◆ User Name: input “cmsuser”.
 - ◆ Organization: input “hospital”
 - ◆ Serial Number: input the serial number listed on the Solidcore authorization label.
(The Solidcore authorization label is located on the CD case of the CMS system software)
10. After input the information, click the “Next” button.
11. In the subsequent steps of the installation, the configurations are set by default.

5.2 Enabling the Solidifier

- Once the installation is complete, double click the icon of *McAfee Solidifier Command Line* on the desktop. Then the following McAfee Command Line window displays.



- Input "sadmin so" in the command line window, and press the "Enter" key. The computer performs solidification scan.
- After the scan is done, input "sadmin enable" in the command line window, and press the "Enter" key.
At this moment, a message indicates that Solidcore will run after the computer restarts.
- Re-start the CMS host after the above operations are finished.
- Enter the CMS screen, and then press the group keys "Ctrl+Alt+Del" to start "Windows Task Manager".
- Click the "Processes" tab, and then end the "Master.exe" process.
- Close "Windows Task Manager", and return to the OS desktop.
- Double click the "McAfee Solidifier Command Line" icon on the desktop to access to the "McAfee Command Line" window.
- Input the "sadmin status" to check whether the Solidcore is in the "Enabled" state or not, as shown in the following figure.

The screenshot shows the same McAfee Solidifier Command Line window. The user has entered "sadmin status" and pressed Enter. The output is as follows:

```
Microsoft Windows XP [version 5.1.2600]
(C)Copyright 1985-2001 Microsoft Corp.

C:\Program Files\Solidcore\S3>sadmin status
McAfee Solidifier:           Enabled
McAfee Solidifier on reboot: Enabled

System Controller:          Disconnected
Local CLI access:           Recovered

[fstype]      [status]      [driver status] [volume]
* NTFS        Solidified   Attached       C:\
  NTFS        Solidified   Attached       D:\
  FAT32       Solidified   Attached       E:\`
```

A red box highlights the line "McAfee Solidifier: Enabled". A red arrow points from the text "Solidcore state" to this highlighted line.

If the state is correct, it indicates that the installation is complete.

WARNING

- **Ensure that the operating environment of CMS is free from virus before the installation of Solidcore. Otherwise, the CMS may break down after the installation of Solidcore.**
-

NOTE

- **The above-mentioned installation is required only when you select to install the software of Solidcore S3 Control.**
 - **Perform the installation of Solidcore S3 Control after other software is installed.**
-

5.3 Adding or Editing Additional Applications

If applications have to be added, deleted or updated after the installation of Solidcore S3 Control, perform the following to enable the changes under the control of Solidcore:

1. Double click the icon of McAfee Solidifier Command Line on the desktop and the corresponding window will display.
2. Input "sadmin disable" in the command line, press the "Enter" key, and then restart the PC.
The Solidcore control is disabled. You can add or delete the additional applications.
3. Double click the icon of McAfee Solidifier Command Line on the desktop, and then input "sadmin so" to scan all of applications.
4. Input "sadmin enable" in the command line, press the "Enter" key, and then restart the PC.

Other commonly used commands of McAfee Solidifier include:

- sadmin help: used to view the commonly used commands;
- sadmin status: used to view the status of McAfee.

FOR YOUR NOTES

6 System Recovery

6.1 Overview

The central monitoring system (CMS) is installed in the dual hard disks computer. When one of the dual hard disks fails, replace the faulty disk with a new one. The new disk recovers automatically.

When both hard disks fail, perform the following procedure:

6.2 HDD Replacement Procedure

6.2.1 Tools Required

- Software:
 - ◆ 801-300B-00010-00 DPM CMS FRU HD IMAGE
 - ◆ 300B-30-47716 BeneVision-CMS SOFTWARE TOOLS
 - ◆ 115-031840-00 BeneVision-CMS SYSTEM SOFTWARE
 - ◆ 115-012226-00 MCAFEE SOLIDCORE

- Hardware:
 - ◆ Screw driver with TORX T15 Bit or large flat blade screwdriver.
 - ◆ Replacement Hard Drive/s PN 0992-00-0287 Seagate 500 GB.

NOTE

-
- In a BeneVision CMS RAID configuration both drives must be the exact same type.
-

6.2.2 Replacing Both Hard Drives in a RAID Configured

BeneVision CMS

1. Replace both Hard Drives.

NOTE

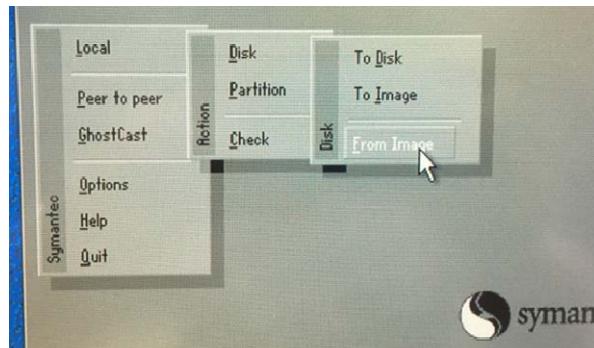
-
- Drives must be of the same manufacture and size.
-

2. Turn on computer, then hit “ctrl-I” on the keyboard as the first screen appears to enter “Intel Rapid Storage Technology” Main Menu screen.

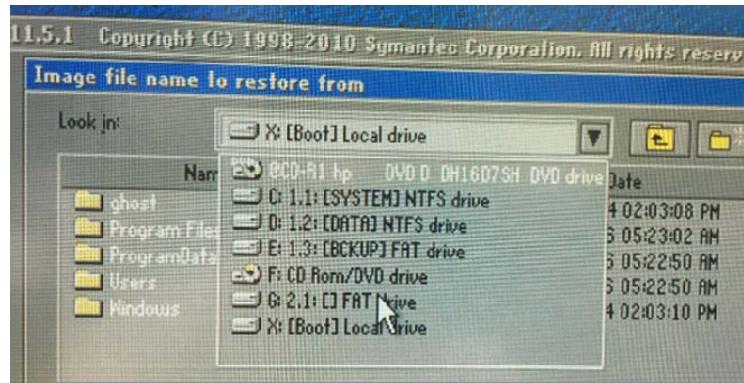


3. Select “Create RAID Volume”. (You will delete everything on the hard drives if they already have information stored on them.)
4. Accept “default name”, then select “RAID1 (Mirror)” for the RAID Level, and finally select “Create Volume”.
5. Plug the USB stick containing the Windows 7 HDD image (P/N 801-330B-00010-00), into the USB port on the front of the computer.
6. Exit the Intel® Rapid Storage Technology program, the system will go through its normal boot sequence. Press “F9” to access the Boot Menu. The system will ask for a password. Type in “Hypernet” (case sensitive) and press “Enter”.
7. Highlight “USB Device” using the up and down arrows and press enter.
8. After the BeneVision CMS boots from the USB drive hit ok at the Symantec Ghost Splash Screen. This may take several minutes.
9. When the “About Symantec Ghost” prompt screen appears, click the “OK” dialog to proceed.

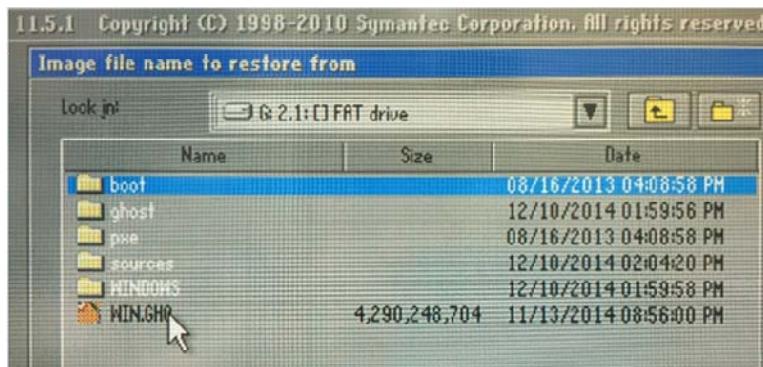
-
- From the Symantec Ghost menu, select “Local” → “Disk” → “From Image”.



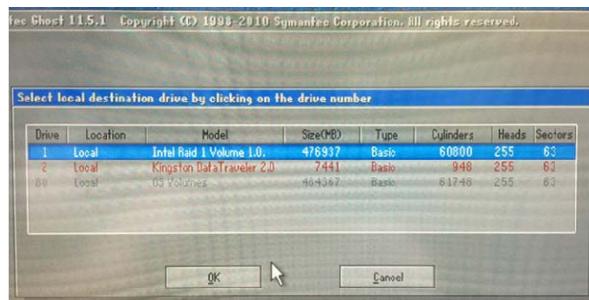
- When the prompt opens, click on the “Look in:” dialog to select the corresponding USB drive which contains the ghost image. As an example, in the image below the files are located on the G Drive.



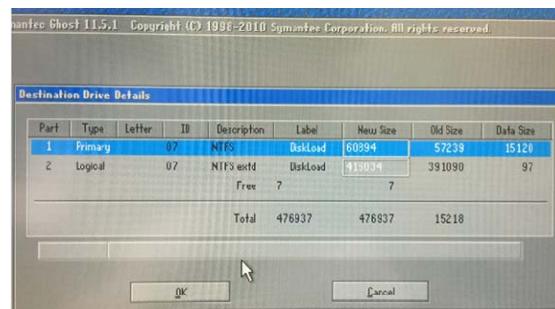
- Select the WIN.GHO file located within the “HP 8380 RAID WIN 7” folder. Click on the WIN.GHO file to select the actual ghost file.



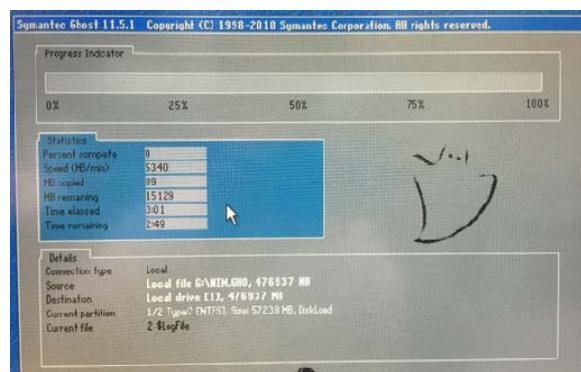
13. When prompted, select the destination drive to install the operating system which is the “Intel Raid” volume as shown in the figure below.



14. In the next screen, the dialog will show the destination drive details. Click “OK” to accept all default values.



15. Click “Yes” to acknowledge that the destination drive will be erased during the ghosting process.
16. Allow the ghosting process to complete. While the process is underway, the dialog window will show its progress from 0% to 100% as well as an estimated time remaining to complete the task.



-
17. When the ghosting process is finished, click on “Continue” to close the “Clone Complete” dialog window.
 18. Select “Quit” to exit from the Norton Ghost program. If a popup dialog windows asks for confirmation to quit, click “Yes”.
 19. Unplug the USB stick containing the ghosting images from the front of the machine.
 20. Restart the computer by holding down the power button to turn off the PC, and then turn it back on. Once the computer has restarted allow the computer to start normally and display the Windows desktop.
 21. Click on the windows “Start” button at the lower left hand corner of the Window. Right click on the “Computer” menu and select “Properties”. In the dialog window that appears, click on the bottom of the window over the text “You must activate today. Activate Windows now.”
 22. When prompted, type in the Windows Product ID from the label that is affixed to the top of the machine.



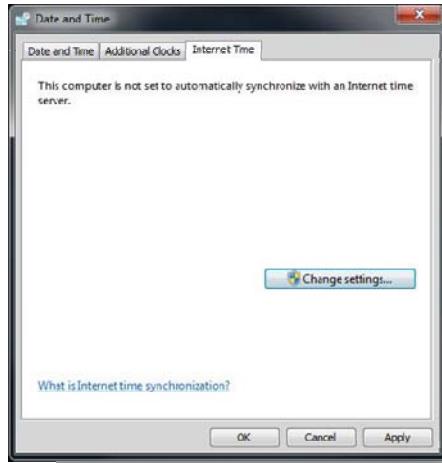
23. Use the phone system for activation. Follow the onscreen instructions for dialing the phone number and inputting the installation ID. Once the system validates the ID, type in the Confirmation ID. Follow the on screen instructions to finish the activation process. At the conclusion of activation, exit back to the Windows desktop.
24. Click on the Date and Time in the tray at the lower right hand corner of the screen.



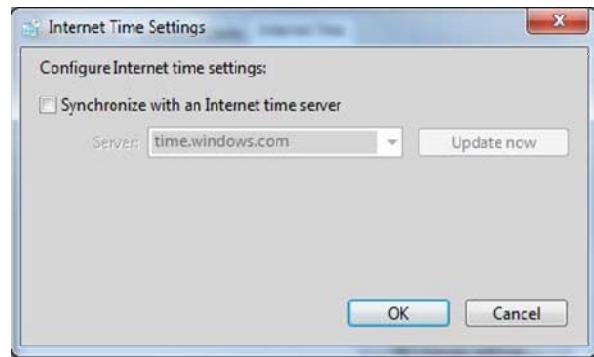
25. Click on “Change Time and Date Settings...”.



26. Click on the “Internet Time” tab.



27. Click “Change Settings”.



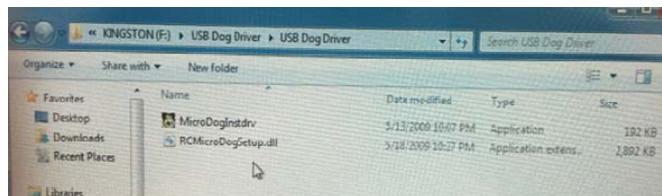
-
28. Uncheck the “Synchronize with an Internet time server” box. Then click “OK”.



29. From the “Date and Time” tab click on “Change time zone...”.



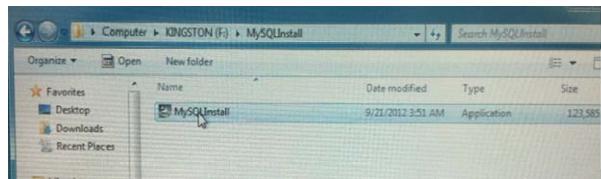
30. Uncheck the box labeled “Automatically adjust clock for Daylight Saving Time”. Then Click “OK”.
31. From the “Date and Time” menu, click “OK”.
32. Insert the CD containing the Software Tool (P/N 300B-30-47716).
33. Click and open the folder titled “USB Dog Driver”. Open the subfolders and double click on the “MicroDogInstdrv” application. The application installs the driver for the license dongle.



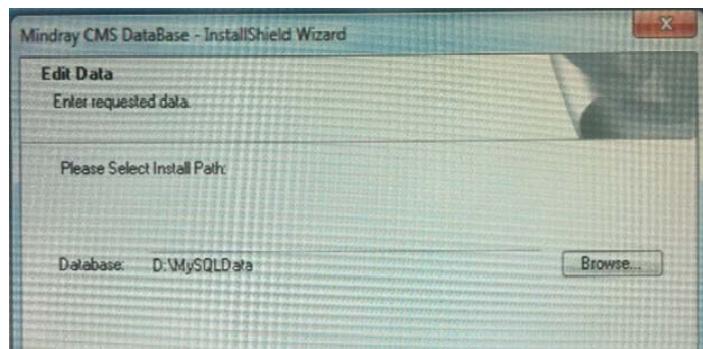
-
34. When the Micro Dog Driver installation window opens, select “USB Dog Driver” under Driver Installation. Finally click Install Driver button on the lower left hand side of the window.
 35. When installation is complete, look for the message in red “The driver has been installed successfully”. Click “Exit” to exit from installation of the Micro Dog Driver.



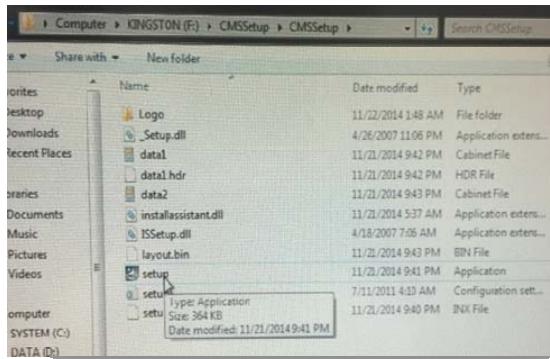
36. From the same CD, click and open the “MySQL Community Server” folder”. Double click on the “MySQLInstall” application. Follow the on screen prompts to start the SQL installation.



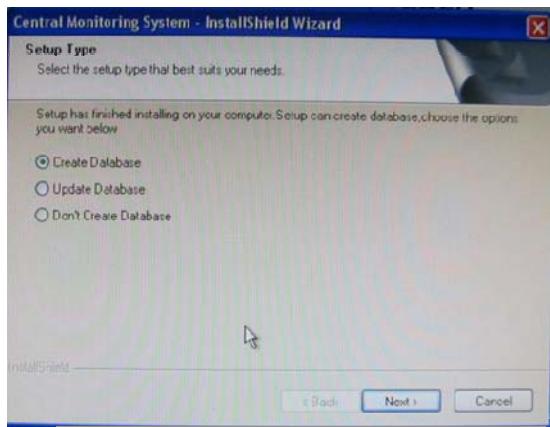
37. Follow the prompts to install the SQL server. Select English as the default language. Accept the default installation location on the D Drive, D:\MySQLData\.



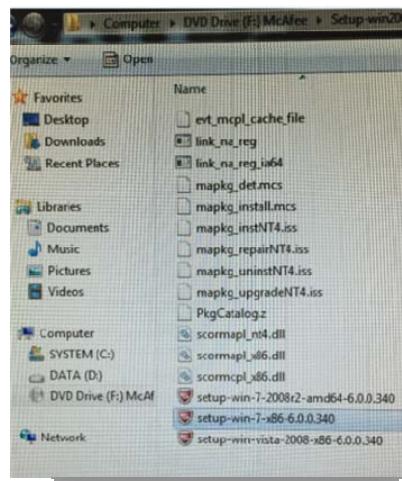
-
38. When prompted, choose “Yes, I want to restart my computer now” and click “Finish”.
 39. Connect an Ethernet cable between the LAN connection on the back of the computer and an Ethernet hub or switch.
 40. From the Windows 7 desktop, click the “START” icon, Click “CONTROL PANEL”, Click “NETWORK AND SHARING CENTER”, click “CHANGE ADAPTER SETTINGS”.
 41. Configure the “Local Area Connection 2” for static IP address with an address of 196.76.0.XXX and a subnet mask of 255.255.0.0.
 42. Configure the “Local Area Connection” for static IP address with an address of 191.168.0.XXX and a subnet mask of 255.255.255.0.
 43. Insert the BENEVISION CMS Software CD, 110-004112-00. Click to select and open the “CMSSetup” folder. Double click to open the “setup.exe” application to begin the installation process.



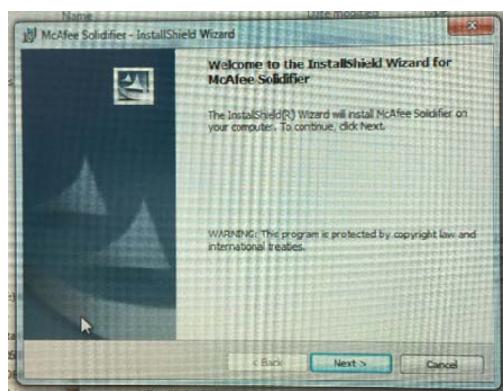
44. When prompted, select English as the default language. Also select the Ethernet port with the static IP address of 196.76.0.XXX as the patient network port. When prompted, select “Create Database”.



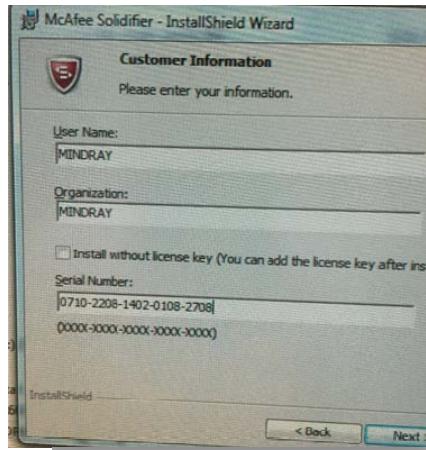
-
45. A “Create database, please wait...” message will appear. Creating the database will take a few minutes to complete.
46. “Restarting Windows” will open automatically. Highlight the “Yes, I want to restart my computer now” radio button, the computer will reboot automatically after “OK” is clicked.
47. Allow the machine to startup normally and acknowledge any prompts that appear. From the Central Station, click on “System Setup” then “Factory Setup”. Enter the password. Select “Exit to Windows” to reach the Windows desktop.
48. Install the McAfee Solidifier. Insert the McAfee Solidcore Software CD (P/N 115-012226-00). Select and open the “Setup-win2008-win7” folder. Double click on the application “setup-win-7-x86-6.0.0.340.exe”.



49. Follow the on screen instructions to install the software to install the McAfee Solidifier Software.
- Click “Next”.



-
- b. Click “I accept the terms in the license agreement” followed by “Next >”.



- c. Enter “MINDRAY” for both user name and organization. Type in the serial number, “0710-2208-1402-0108-2708”. Click “Next >” when complete.
- d. At The “Destination Folder” prompt, click on “Next >”.
- e. At the ‘Ready to Install the Program’ prompt, click on “Install >”.
- f. Click “Finish” after the install is complete.
- g. Double click on the “McAfee Solidifier Command Line” shortcut on the desktop.



- h. In the command prompt, enter “sadmin so” command and press the “Enter” button.
This process should take approximately ten minutes.

```
McAfee Solidifier Command Line
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Program Files\McAfee\Solidcore>sadmin so
Solidifying volume C:\
00:02:39: Total files scanned 17326, solidified 5913
Solidifying volume D:\
00:00:02: Total files scanned 1172, solidified 0
C:\Program Files\McAfee\Solidcore>
```

- i. Next enter the following commands and press the “Enter” button after each one.
 - ◆ “sadmin enable”
 - ◆ “sadmin updaters add gui.exe”

-
- ◆ “sadmin updaters add translator.exe”
 - ◆ “sadmin features disable mp”
- j. Restart the computer and exit to Windows desktop.
 - k. Double click on the “McAfee Solidifier Command Line” shortcut on the desktop.
 - l. Run the following command and press the “Enter” button after each one:
 - ◆ “sadmin status”
 - ◆ “sadmin updaters list”
 - ◆ For “sadmin status” command, the software should show “McAfee Solidifier” and “McAfee Solidifier on reboot” as both enabled.
 - ◆ For “sadmin updaters list” command, the software should show a list of programs and their statuses.
50. Restart Computer. From the CMS program select “System Setup” → “Admin Setup” → enter “111111” → “Other” → “Database Backup and Recovery” to Restore the Database using the previously backed up .bak file, or manually configure all BeneVision CMS settings and Peripheral Devices. Return system to service.

NOTE

- **Do not recover the system with the method of recovery from hard disk if system failure is caused by other reasons.**
-

NOTE

- **System recovery will format disk C and disk D of the hard disk. So backup your desired data in disk C and disk D before performing the recovery operation. We assume no responsibility for loss of data during the recovery.**
-

6.3 Database Backup

Refer to section 3.10.5 Initial Database **Backup**.

6.4 Configuring Printer

Refer to section 3.6 Printer Installation.

6.5 Installing Dual Displays

Refer to section 3.3.1 Implementing Double Screen Display by DP-to-VGA Adapter for dual displays connection and settings.

6.6 Installing Multiple Displays

Refer to section 3.3.5 Installing Multi-Screen Extend Device (SUNIX VGA2715) for three or four displays connection and settings.

6.7 Setting the Size of CMS Screen

Access the CMS system. Select “System Setup” → “Admin Setup” → “Screen Size”. Adjust the screen size of the CMS system in accordance with actual screen size. Restart PC to enable the screen size settings.

6.8 Setting Language and Time

Refer to section 3.10.1 Setting the Region and Language of the Operating System for language settings.

Refer to section 3.10.2 Setting Operating System Time for time settings.

FOR YOUR NOTES

7 Maintenance and Cleaning

7.1 Maintenance

Failure on the part of the responsible hospital or institution employing the use of the central monitoring system to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazard.

⚠️WARNING

- The safety checks or servicing involving any disassembly of devices should be performed by professional servicing personnel; otherwise, it may lead to undue equipment failure and possible health hazards.
-

7.1.1 General Inspection

Whenever your system is repaired or upgraded, a thorough inspection should be performed by qualified service personnel to ensure the reliability.

Before the central monitoring system is put into use and when it is in use, follow these guidelines to inspect it:

- Inspect the equipment and its accessories for mechanical damage;
- Inspect if the environment and power supply meet the specified requirements;
- Inspect all power cords and signal lines for fraying or other damages, and if they are properly connected and insulated;
- Inspect if the sound system functions normally;
- Inspect if each function of the system is in good condition;
- In case of any damage or abnormality, do not use the central monitoring system. Contact the hospital biomedical engineers or our service personnel immediately.

7.1.2 System Performance Test

After the central monitoring system is reinstalled or quick recovery installation is performed, follow this procedure to make sure that the system functions correctly:

- Display setup
- Functional test of admitting patient
- Record and print
- Clear test data
- Shut down

7.2 Cleaning

Your equipment should be cleaned on a regular basis. If the CMS accumulates heavy dust, it should be cleaned regularly. The equipment to be cleaned includes the main unit (including power fan, cabinet fan or other fan etc.), displays, printer, recorder, keyboard and mouse.

Before cleaning the equipment, consult your hospital's regulations for cleaning, disinfecting and sterilizing equipment

⚠️WARNING

- Be sure to shut down the system and disconnect all power cords from the outlet before cleaning the equipment.
 - Cooling fans installed on CPU, display adapter and cabinet should be cleaned on a regular 6-months time interval. If any malfunction of cooling fan is encountered, please contact supplier for replacement as soon as possible. Dust accumulation on cooling fans can lead to failure due to high temperature.
-

The exterior surfaces of the equipment may be cleaned with a clean and soft cloth, sponge or cotton ball, dampened with a non-erosive cleaning solution. Drying off excess cleaning solution before cleaning the equipment is recommended. Following are examples of cleaning solutions:

- Hydrogen peroxide (3%)
- Ethyl alcohol (70%)
- Host cleaning solutions
- Liquid crystal display (LCD) detergent

Follow these rules to clean the equipment; Failure to do so may cause the material to melt, distort, or may dull the finish of the case, blur lettering on the labels, or cause equipment failures.

- ALWAYS dilute the solutions according to the manufacturer's suggestions.
 - ALWAYS wipe off all the cleaning solution with a dry cloth after cleaning.
 - NEVER SUBMERGE the equipment into water or any cleaning solution, or POUR or SPRAY water or any cleaning solution on the equipment.
 - NEVER permit fluids to run into the casing, switches, connectors, or any ventilation openings in the equipment.
 - NEVER use abrasive materials and erosive or acetone –based cleaners.
-

WARNING

- **Disinfection or sterilization may cause damage to the equipment; therefore, when preparing to disinfect or sterilize the equipment, consult your hospital's infection controllers or professionals.**
 - **The cleaning solutions above can only be used for general cleaning. If you use them to control infections, we shall assume no responsibility for the effectiveness.**
-

7.3 Preventative Maintenance

7.3.1 Display Monitors

The monitor panel and housing should be cleaned by the user as required.

WARNING

- **Do not clean the monitor while it is turned on and/or plugged in.**
-

NOTE

-
- **Never use an abrasive glass cleaner containing highly concentrated ammonia and strong base chemicals since they damage the surface treatment.**
-

7.3.2 LCD Display Chassis

WARNING

- **Do not clean the monitor while it is turned on and/or plugged in.**
 - **Do not spray any cleaner directly on a display. It could possibly leak inside the unit and cause damage.**
-

Clean the chassis with a lightly moistened soft cloth.

7.3.3 Care and Cleaning of the Screen/Touchscreen

For the best performance, it is recommended that the touch screen on the BeneVision display(s) be kept clean. You can use any standard glass cleaner to clean the screen. Use a cloth or towel to apply the cleaner. Glass cleaner sprayed directly on a display could possibly leak inside a non-sealed unit and cause damage. Remove fingerprints and stains by using a liquid lens cleaner and a soft cloth.

To prevent scratches on the front panel of the display screen, observe the following precautions when cleaning:

WARNING

- **DO NOT spray any liquids directly on the screen.**
 - **DO NOT use abrasive cleaning materials to clean a touch screen.**
 - **DO NOT wipe a dry screen.**
 - **DO NOT use alcohol or chlorinated hydrocarbon solvents.**
 - **Use a fine soft-hair brush to carefully brush away dust and dirt particles.**
 - **Use a soft cloth moistened with cleaner solution to wipe the touch screen clean.**
-

7.3.4 CMS Chassis, Gateways, Telemetry Server Chassis and Wireless Transceiver

The external cleaning procedures should only be performed by a qualified electronic technician.

Cleaning

Use an anti-static vacuum to carefully remove accumulated dust, dirt, and lint from the various external surface areas. Be careful not to dislodge components, or connectors.

Visual Inspection

Perform a visual check to verify that dust, dirt, and lint has been completely removed, and all connectors are secured and all fans are operational.

7.3.5 Uninterruptible Power Supplies (UPS)

7.3.5.1 Rack Mounted UPS

The battery is designed to last for three (3) to five (5) years under normal use. The UPS performs a self-test automatically every two (2) weeks. If the test fails, the battery LED on the front panel of the UPS will be illuminated. If this occurs, replace the battery cartridge.

Refer to the UPS manufacturer's website for replacement battery cartridge specifications. Instructions for battery replacement are included with the replacement battery cartridge.

Mindray does not supply replacement battery cartridges for the UPS.

7.3.5.2 Desktop and Auxiliary UPS

Under normal conditions, the original battery in the UPS will last several years. Each UPS has a self-test function to determine the status of the internal battery.

7.3.5.3 UPS Model OmniVS800

To run a self-test, leave connected equipment on. With the UPS plugged in and ON, press and hold the button until the UPS beeps (about 2 seconds) then release it. If the batteries are weak, the "Replace Battery" LED will stay lit and the UPS will continue to beep after the test.

Refer to the UPS manufacturer's website for replacement battery specifications. Instructions for battery replacement are included with the replacement battery cartridge.

7.3.6 CMS Network Equipment Racks

Use an anti-static vacuum to carefully remove accumulated dust, dirt, and lint from the various external surface areas. Be careful not to dislodge components, or connectors.

Verify the mechanical integrity of all cables, wires, and network connections. Replace any frayed or kinked cables.

7.3.7 System Maintenance Schedule

7.3.7.1 Preventative/Periodic Maintenance

The Preventative Maintenance for the BeneVision Monitoring Network will consist of periodic cleaning, inspection and testing.

Network Components such as Ethernet switches, KVM switches and extenders, Antennas, and Wireless Access points have no preventative maintenance requirements.

Telemetry Packs do not require any preventative maintenance requirement other than cleaning. Refer to telemetry operator's manual for cleaning and testing instructions.

Use the following tables for each maintenance procedure:

Central Station and Telemetry Server and Equipment Rack.

Activity Area	Action	Technical Level	Method	Schedule
Cooling fans	Clean	BioMed/CE	Forced air	Annually
Power supply	Clean	BioMed/CE	Forced air	Annually
Fans	Clean	BioMed/CE	Forced air	Annually
Connections	Inspect	BioMed/CE	/	Annually
Cases	Inspect	BioMed/CE	/	Annually
UPS batteries	Test	BioMed/CE	See section 7.3.5 <i>Uninterruptible Power Supplies (UPS)</i>	Annually

8 Parts

The parts list is shown in below table.

No.	P/N	Description
1	023-000969-00	CentralStation host (Tower)
2	023-001020-00	CentralStation host (2U)
3	023-000969-00	WorkStation host (Tower)
4	023-001020-00	WorkStation host (2U)
5	023-000969-00	ViewStation host (Tower)
6	023-001020-00	ViewStation host (2U)
7	115-032428-00	Dongle for CentralStation
8	115-032426-00	Dongle for WorkStation
9	115-032427-00	Dongle for ViewStation
10	023-000110-00	LCD 19" display
11	023-001128-00	LCD 19" touchscreen
12	023-000214-00	Display to VGA adapter
13	023-000766-00	USB to VGA adapter
14	DA8K-10-14452	Power cable
15	115-032908-00	Recorder with power cable (TR6F)
16	023-000773-00	USB KVM extender
17	023-001138-00	PS/2 mouse
18	0000-10-10937	PS/2 keyboard
19	023-000525-00	USB mouse and keyboard
20	023-000739-00	USB to RS-232 adapter
21	0992-00-0091-08	HP M602 laser printer
22	023-001139-00	HP M605n laser printer

The following table lists the parts used for Kontron KISS 2U V2 KTQ87 (P/N: 023-001020-00).

1	023-001212-00	Motherboard, 810582-4500 (KISS 2U V2 KTQ87)
2	023-001201-00	Power supply, R1S2-5300V4V
3	023-001202-00	CPU, SR14J /i5-4570S 2.90 GHz
4	023-001205-00	Memory, VL37B5263A-K9SD (4G)
5	023-001203-00	HDD, WD5003ABYZ
6	023-001209-00	DVD, SH-224DB
7	023-001204-00	USB-to-DVI adapter, VGA 2725

9 Troubleshooting

9.1 The displaying text on the CMS screen is abnormal.

Please ensure the region and language of the operating system is the same with the language set in the CMS system.

1. To set up the region and language of the operating system, refer to section ***3.10.1 Setting the Region and Language of the Operating System.***
2. To set up the language of the CMS, Click “System Setup” → “Admin Setup” → “Other” → “Language” and select the desired language.

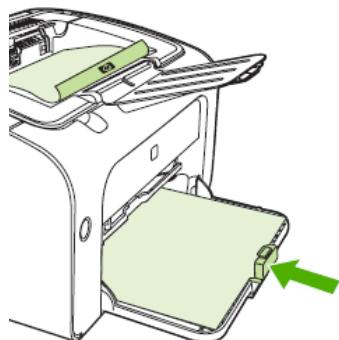
9.2 Recorder/printer-related technical alarm messages

Please refer to the Appendix B in “BeneVision Central Monitoring System Operator’s Manual”.

When print fails, please follow the instruction to recover the print job:

1. Restart the printer.
2. Click the “System Setup” button and then select the “Printing Control” tab.
3. Click the button “Restart Print Service” to resume.
4. Select the relevant printer in “Printing Control” tab.

Also, after the paper is loaded in the main input tray, push the tab close to the end of paper.



9.3 Network printing fails

Follow the steps below:

1. Click “System Setup” button and then select “Printing Control” tab. Restart the print job. Try other printers in the printer list. If the problem still exists, go to the next step.
2. Check whether network printing works in Windows system. If it works, restart the computer, enter the CMS and repeat step 1. If the problem still exists, go to the next step.
3. Verify the network cable between printer and CMS host is operational.
4. Verify the printer’s IP address and CMS host’s IP addresses are in the same network segment. Please refer to printer’s accompanying documents or ask the vendor’s customer service for the method of getting printer’s IP address.
5. If the verification is Ok but the problem still exists, try to delete the printer driver and reinstall it by referring to section **3.6 Printer Installation**.
6. If the problem still exists after driver installation, please contact the printer vendor’s customer service.

9.4 No waveform displayed in waveform review

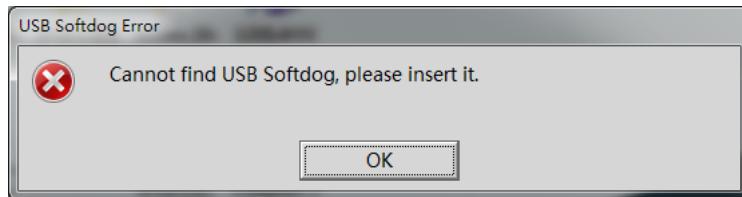
This symptom indicates that the user does not add the waveforms that need to be saved. To remove this fault, click in the patient window and then select “Display Setup” to enter the “Display Setup” tab sheet, select “Wave Save” and then add your desired waveforms.

9.5 Multi-/Dual-screen changes to Single-screen during the CMS installation

1. Check if the displays are connected to host and work functionally.
2. Check if the display mode is set correctly; please refer to section **错误!未找到引用源。 错误!未找到引用源。**, **3.3.1 Implementing Double Screen Display by DP-to-VGA Adapter** or **3.3.5 Installing Multi-Screen Extend Device (SUNIX VGA2715)**.

9.6 Remove Dongle Error

The following prompt message may appear during installation or running.



Dongle error may be caused by dongle driver not installed, dongle inserted improperly, or USB port damaged. Please check dongle driver or reinsert dongle.

9.7 CMS Unable to Connect the Bedside Monitor

This fault may be caused by network configuration, network cable plugged improperly, network cable damaged etc. Refer to the following procedures to troubleshoot this fault.

1. Check if the network cable is plugged properly.
2. Check network configuration to see if the IP address of the CMS and that of network bed number of the monitor are configured correctly.
3. Use ping command to check if the CMS can be connected to the bedside monitor. Try to ping as many monitors as possible. In the case of ping failure, the fault may lie in hardware.
4. Check if the crystal connector on the network cable or the network cable is damaged.

9.8 Abnormal Database Service Handling

If database service stops by accident or runs abnormally, it will make the CMS unable to normally save patient data. When this situation occurs, please try to restart the CMS. If the high level system alarm disappears, it indicates that database service has been restored to normal storage status. If the high level system alarm persists, it indicates that database is severely damaged. In this case, you need to re-install database software. Please refer to **section 3.5 Database Software Installation** for detailed operation.

9.9 Database Backup and Recovery in Case of System Failure

You can use the database backup and recovery tool to back up the current database and restore the database. For example, you should backup the current database before you replace the hard disk drive, reinstall the operating system or recover the CMS using the mobile hard disk tool, and then restore the database after the operating system has been installed or the CMS has been recovered.

For database backup and recovery, refer to the operating manual.

9.10 eGateway Unable to Obtain the Exported Files from the CMS

If the CMS exported files cannot be received on the eGateway, you need change the settings on CMS and eGateway as followings.

Change the Firewall Settings on the CMS Host

1. Open “Control Panel”.
2. Select “Windows Firewall”, and then “Allow a program or feature through Windows Firewall”.
3. Allow “File and Printer Sharing” and “netlogon service” applications to pass through all network firewalls.

Change the SMB Authentication Level on the eGateway Host

1. Run “GPedit.msc”.
2. Select “Computer Configuration”→“Windows Settings”→“Security Settings”→“Local Policies”→“Security Options”.
3. Double click “Network security: LAN Manager authentication level”. The properties screen displays.
4. Set “Network security: LAN Manager authentication level” value to “Send LM & NTLM – use NTLMv2 session if negotiated”.
5. Run “Services.msc”, and restart the “Server” service.

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